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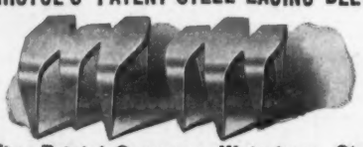
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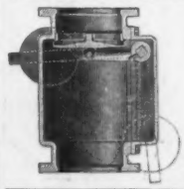
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New Champion Lathe Features.

A new change gear box for feeding and thread cutting giving 40 changes of each and a new double back gear have been developed by the Champion Tool Works Company, Cincinnati, Ohio, for application to its lathes. Fig. 1 shows a lathe equipped with the new feed box and Fig. 2 a lathe with the new back gear. The other illustrations give details of the two mechanisms.

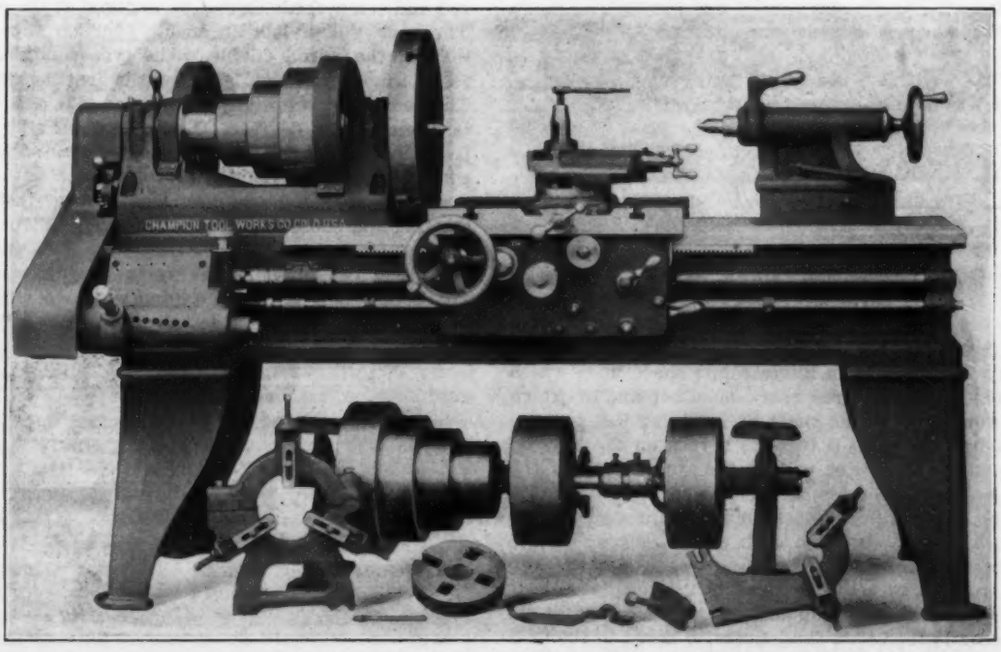


Fig. 1.—A Lathe with the New Feed Box, Built by the Champion Tool Works Company, Cincinnati, Ohio.

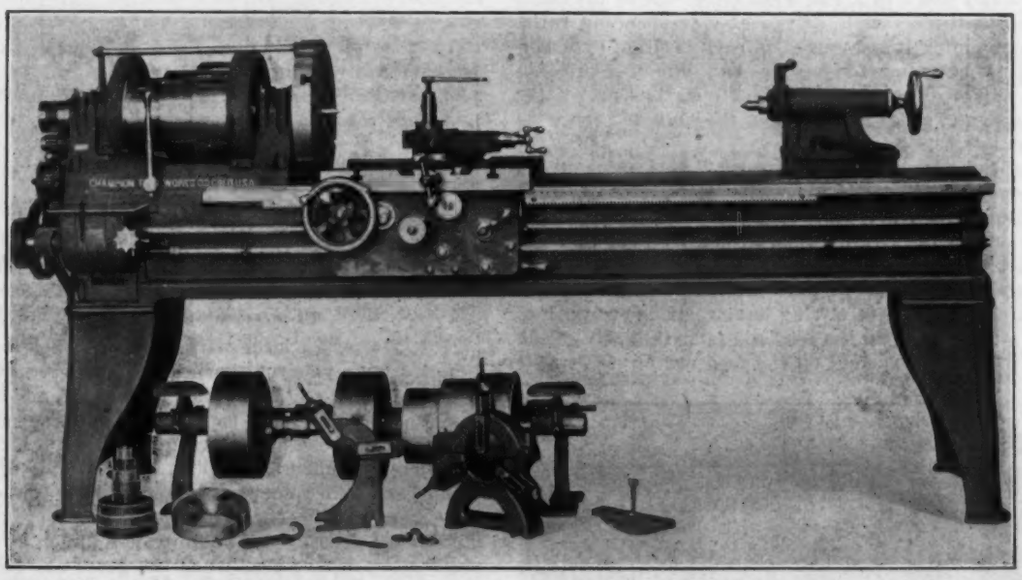


Fig. 2.—A Champion Lathe with the New Double Back Gear.

The Feed Box.

Without removing or replacing any gears or manipulating a quadrant 40 different screw threads, ranging from 2 to 56 to the inch, including 11½, or 40 non-duplicating feeds, bearing a ratio of 3½ to 1 with the threads, may be obtained with the change gear box. By moving the yoke handle A, Fig. 3, to engage its latching pin in the holes in the case, eight changes of feeds or threads are obtained; by turning the knob B to one or another of its three positions these eight changes are tripled, making 24, and the in or out position of the push key C compounds these 24 changes. These feeds and threads may be further varied by changing a gear on the head end of the box. An index indicates the positions for the yoke handle, knob and push key for the various screw pitches and feeds.

In Fig. 3 will be seen the train of gears connecting the head spindle with the driving gear in the gear box. Either one of the gears *d* and *e* on the stud in the head-stock may be made the driver by means of the push key C, which when pushed in engages the larger gear and when pulled out engages the smaller gear. These gears transmit motion to the lead screw through the other gears and in different ratios.

The gear *f* is mounted on a long pinion, which passes through the box and is journaled at both ends. On this pinion slides a yoke carrying an intermediate gear which can be made to mesh into any one of the cone of gears *g* by sliding the yoke along the pinion. In front of the gear box is a series of eight holes, which serve to locate the intermediate gear in any desired position by entering the plunger pin in the yoke in the required hole.

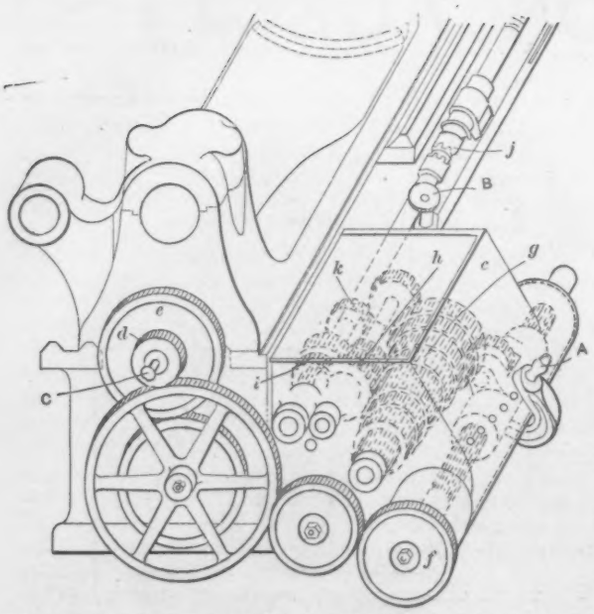


Fig. 3.—Isometric Perspective Showing the Gear Arrangement in the New Feed Box.

Motion is transmitted from the largest gear in the cone of gears *g* to a gear on an intermediate shaft, upon which are loosely mounted three gears, *h*, either one of which may be connected to the shaft by a sliding key therein, controlled by the knob B through a rack on the key rod and pinion on the lower end of the stud to which the knob is secured. The key is set transversely to the pin and normally rests in a recess turned in the gears, there being such a recess between each pair of gears. In the three gears *h* are cut six keyways into which the key can be brought, thereby locking the intermediate shaft to that particular gear and making it the driver of its mating gear in the set of three gears, *i*, keyed to the lead screw. The gears *h* and *i* are arranged in the ratio of 2 to 1, 1 to 1 and 1 to 2, and when either one of the gears is engaged the screw is driven at corresponding ratio. The knob pinion B is retained in each position by a ball backed by a spring, forcing the ball into a depression placed opposite each of the three stops, thus preventing the key working out except when the knob is turned by the operator.

The lead screw can be disconnected entirely from the gear box by disengaging a positive jaw clutch, *j*, when it is desired to leave only the feed rod running. The gear *k* inside the box drives a clutch gear on the feed rod (not shown), thus enabling the operator to secure as many feeds as the threads that can be cut. Inside the clutch gear is a steel ring having six keyways, into which a double key on the feed rod is maintained by the action of two coil springs on the feed rod on either side of the clutch. On either side of the lathe apron and on the feed rod are two adjustable collars, shown in Fig. 1, which are acted upon by stops in the apron and provide an automatic stop to the length of feed for either direction of the lathe carriage by moving the feed rod longitudinally until the key on the feed rod moves into a recess on either side of the clutch ring in the gear. This movement compresses one or the other of the coil springs, and when the stop collars and the carriage are moved apart the opposite spring draws the rod into the clutch again.

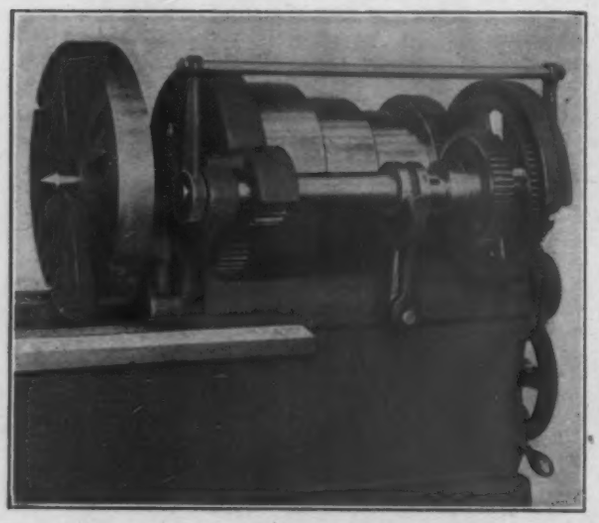


Fig. 4.—Rear View of the Headstock, Showing the New Double Back Gear.

The carriage rack pinion can be withdrawn when chasing threads, and the apron feed reverse is made non-interfering with the lead screw half nut, so that rod and screw feeds cannot be engaged at the same time. The rack pinion has an inside bearing, thus virtually making the apron double. The cross and longitudinal feeds are by friction and independent of each other. The compound rest slides have taper gibs and the swivel is graduated in degrees. The compound rest and cross feed screws have dials graduated in thousandths, and the carriage has a chasing dial connecting with the lead screw, so that the operator may engage instantly the starting and subsequent cuts on screws without reversing the countershaft or stopping the lathe. This permits running both countershaft pulleys in one direction, giving (with the back gears) 16 spindle speeds with a four-step cone pulley for a wide belt. All gears are enclosed.

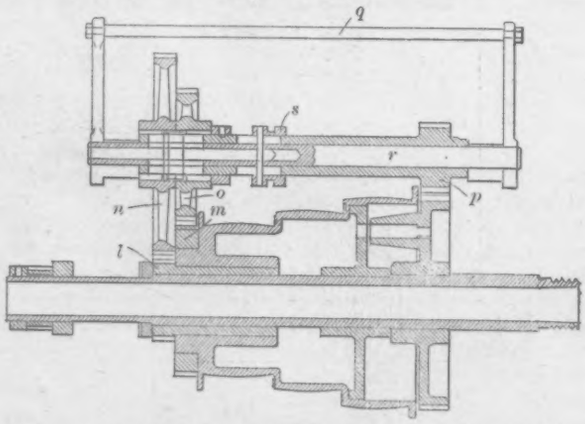


Fig. 5.—Sectional Plan of the Champion Double Back Gear.

The guard at the head end is hinged and has a spring catch, and can be released to swing back for oiling the gear bearings or may be lifted off entirely.

This quick change gear device is applicable to the 12, 14, 16 and 18 in. lathes manufactured by the company, and is the invention of William Donaldson, secretary and designer of that company.

The Double Back Gear.

Fig. 2 shows a lathe with the new double back gear, Fig. 4 a rear view of the headstock showing the gears and Fig. 5 a sectional plan. Mounted on the lathe spindle is a three-step cone pulley and the usual face gear. On the cone pulley at the small end are two gears of different diameters, *l* and *m*, Fig. 5, which are in constant mesh with somewhat larger gears, *n* and *o*, on the back gear shaft. The latter gears are journaled on a quill at the opposite end of which is a pinion, *p*, that will mesh into the face gear when the gears are brought together by means of the eccentric bearings and operated by bar *q* for throwing the back gears in and out of mesh with the spindle gears. Gears *n* and *o* have their hubs recessed to admit a key which moved in either direction will engage one or the other of the gears with the quill. The quill has a hole bored through its entire length, in which is a shaft, *r*, extending out at either end of the eccentric bearings, its ends serving as journals for the quill. The shaft *r* is bored at one end, to contain a pin carrying a cross key, and its other end is pinned to a grooved collar, *s*, sliding on the quill. The collar takes the fingers of a yoke shown in Fig. 4, and is manipulated by the vertical handle on the front of the headstock, as shown in Fig. 2. By means of the latter the key between the gears *n* and *o*, Fig. 5, can be engaged with either of

those gears. When the handle is in its central position, as in Fig. 2, both gears are disengaged.

It will thus be seen that the operator has perfect control of the back gears without moving from his position, and may change the speed of the spindle from single back gear to double back gear, or *vice versa*, without stopping the countershaft. This double back gear does not interfere with the use of the head without the back or other gears. The speeds are positive, as no friction or other connections are used, but simply a positive clutch. The changes are made while the lathe is running without undue shock or strain upon any part.

This double back gear is applicable to the 16-in. and larger lathes manufactured by the company, and is the invention of John C. Pflanzer, superintendent of the company.

The Féry Radiation Pyrometer in Foundry Work.*

BY CHARLES E. FOSTER.†

Pyrometers have frequently earned an undeserved bad name through mistaken methods in their application. A pyrometer of any new pattern is usually developed in a laboratory, and it is there subjected to preliminary tests under carefully standardized conditions. In industrial work the conditions met are entirely different and if the application is to be a success the conditions of use and the limitations of the pyrometer must both be carefully studied. The maker of the pyrometer is presumably well acquainted with his instruments, but from the nature of his work, and the widely differing industries he comes in touch with, he cannot pose as a master in the details of any given industry. It is, therefore, necessary that the maker and the prospective user co-operate in planning the application, and where this has been done most valuable results have been secured.

The most striking feature of the Féry radiation pyrometer is its ability to work at a distance from the hot body whose temperature is to be measured. Optical pyrometers are subject to serious limitations. They must be used by skilled and careful observers, and they require frequent standardization. In addition, they can only give readings while the user is actively operating them, and even then the readings have to be referred to a conversion table before their meaning in temperature can be known. The metal vapors coming off from molten iron are very active and will rapidly attack the platinum and platinum-rhodium wires of the Le Chatelier thermo-couple. To avoid this danger calls for a protection so heavy that it makes the instrument very slow to take up and follow the temperature of the metal; so much so, in fact, that the reading will reach a steady figure only after the lapse of 10 min. or so, and then refuse to fall as the temperature of the iron falls.

The Féry pyrometer has the advantage of working at a distance and at the same time the directness of reading that is found in the Le Chatelier thermo-couple. It is very simple to operate and is frequently used by foremen and furnace operators. The indications are read or recorded directly in temperature, without conversion, and its steady reading is attained in 20 sec. from the moment of pointing it at the hot body. It is, therefore, particularly suited for following the work in a foundry. The broad principle is that of determining the temperature of a hot body by the radiant heat it gives out; focusing this radiant heat, as by a convex lens, on a small surface, gives a high temperature at the focus, where a small body which is sensitive to heat is placed. All that is needed is to add means for accurately pointing and focusing the instrument and obtaining the right distance from the hot body for the focused radiation to completely cover the sensitive device. These conditions are successfully filled only by the Féry pyrometer. As a means of getting a more open scale and making the readings finer a concave mirror is used in place of a convex lens, but the operation is precisely the same. This concave mirror focuses the heat onto a little thermo-couple. The heating of the thermo-couple gives rise to a current which flows through a cable and a direct reading indicator or recorder. The eyepiece at the rear of the tube enables the user to point and focus the instrument, and at the same time tells him if he is near enough to the object to cover the thermo-couple with the focused image of the hot body.

It will be readily seen that such an instrument has no upper limit to its temperature range. As soon as the top of the scale is reached it is only necessary to cut off some of the heat to get another scale of higher range, which is done in the Féry instrument. An adjustable diaphragm is provided, and when this is swung over the mouth of the tube it cuts off a part of the heat, thus making the instrument less sensitive. By this method two scales are obtained on the one instrument, which is capable of being quickly pointed at any hot body and of indicating any temperature from 1000 degrees F. upwards. The speed of its action is greater than that of any other temperature measuring device, and its accuracy is much above that demanded at present by foundry practice. A Féry pyrometer recently sent by a purchaser to the Bureau of Standards at Washington was found to be accurate within one-half of 1 per cent.

* Presented before the Philadelphia Foundrymen's Association, May 5, 1909.

† Taylor Instrument Company, Rochester, N. Y.

The Nipigon Iron Ore Fields.

Belief in the existence of a great body of hematite iron ore in the Lake Nipigon District has been considerably weakened by the report upon that region prepared by Alfred V. G. Wilson for the Canadian Geological Survey, and published in the summary report of the survey for the last calendar year. Mr. Wilson visited the district two years ago and remained there until the end of October, 1907. When he had visited the district in 1901 there was said to be in the southwest quarter of the area, between Black Sturgeon Lake and Nonwatin Lake, an iron range of considerable extent, upon which numerous claims were subsequently located. The detailed examination made in the summer of 1907 by Mr. Harvie, Mr. Wilson's assistant, shows that there is no iron range there in the commonly accepted sense of the term. On many of the claims specular hematite occurs in small, more or less ramifying veins in a granite and in a schist, the hematite being very pure. It occurs also as a cement between the fragments of a breccia, these fragments being either granites or schists. The exposures showing ore occur along a northwest and southeast line running between Nonwatin and Black Sturgeon lakes, at the foot of a strong escarpment.

Mr. Wilson says that he and Mr. Harvie saw no large masses of ore, and that the several diamond drill holes that have been put down on the properties do not seem to have disclosed any large bodies of hematite. Consequently he feels justified in stating that the geological conditions render it extremely improbable that any bodies of ore of commercial importance occur there. With reference to the iron ranges at Poplar Lodge and east of it, on the east shore of Lake Nipigon, as they were partially investigated in previous years, Mr. Wilson did not make further examinations of them. Summing up, he says that, while the results of the exploration of the two localities in which hematite has been found in the Lake Nipigon District have been largely of the negative character, its true value cannot be known until further work has been done.

After having experimented with an ore furnace, the Compagnie des Forges et Aciéries de la Marine et d'Homecourt at St. Chamond, France, has decided to put in an induction electric furnace, patented by the Gesellschaftfuer Elektrostahlanlagen of Berlin-Nonnendamm. It is to be used in making high quality steel. The electrical appliances will be made by the Compagnie Generale d'Electricite de Creil at Paris, a Siemens concern.

ELECTRIC MOTORS IN STEEL MILLS.

Comments of Electrical Engineers on the Unusual Problems Worked Out at Gary.

In *The Iron Age* of March 11, 1909, liberal extracts were given from a paper on "Rail Mill Electric Motors at Gary, Ind.," read before the March meeting of the American Institute of Electrical Engineers, New York, by B. R. Shover, electrical engineer of the Indiana Steel Company. The proceedings of the Institute give the discussion on Mr. Shover's paper. It was opened by B. A. Behrend, who designed the 17 generators constituting the 40,000-kw. gas engine power plant at Gary.

Mr. Behrend referred to some problems which arose in connection with the generating plant and explained the conditions which must be met in steel mill power plants utilizing alternating current generators for direct connection to gas engines. The load on the power plant at Gary, he explained, is composed chiefly of induction motors of large capacity and slow speed. Thus the amount of lagging current under average operating conditions is likely to be equal to or even to exceed the amount of watt current required by the motors. The power factor at Gary is not likely to exceed 70 per cent. and the generators were designed for a large ampere rating at low power factor. The speaker gave some details of a preliminary investigation of the periodic disturbing forces produced by the engine and the natural frequency of the generating unit. The gas engines at Gary being four-cycle double acting cross tandem engines, two periodic disturbing forces are introduced, due to inequalities in the force of explosions, adjustment of valve gear, leakages, &c., whose frequencies are one per revolution and one-half per revolution of the engine. The latter frequency, absent in steam engines, introduces a complex factor of the greatest importance into the problem of parallel operations of gas engines.

The investigations Mr. Behrend conducted made it possible to determine beforehand the natural frequencies at all excitations of the Gary generators and therefore under all conditions of load and power factor. For the Gary units the frequencies of the forced oscillations likely to be dangerous are 1.39 and 0.695 cycles per

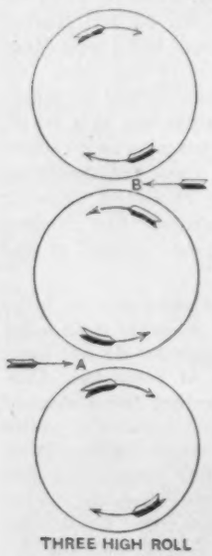


Fig. 1.

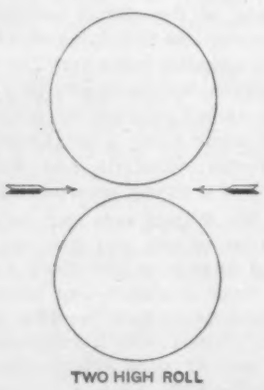


Fig. 2.

second. Very light flywheels had to be used to comply with the conditions. With such wheels dampers are efficient and they were provided on the Gary generators. A flywheel effect of four times that used would have reduced the natural frequency below the lowest forced frequency, giving conditions similar to those obtained in steam engines. The question was carefully considered whether large wheels reducing the natural frequency should not be installed. It was decided, however, to bear up with the greater fluctuations and to install light wheels working between the two forced frequencies of the gas engines.

Mr. Behrend said that the methods he described were applied to the plants of the Carnegie Steel Company at Rankin, Pa., where three 2000-kw. units are operating in multiple; to the plant of the Illinois Steel Company at South Chicago, where four 2000-kw. units are operating in multiple, and to the plant of the American Steel & Wire Company at Cleveland, Ohio, where four 1200-kw. generators are operating in multiple. In all these cases reasonably satisfactory preliminary operation has been obtained. These plants are using blast furnace gas with generators designed by the speaker. In another plant generators of his design direct connected to

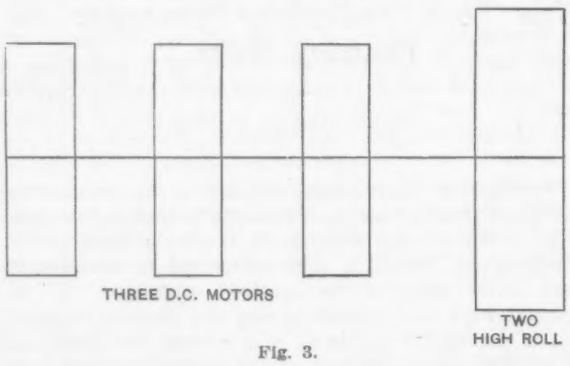


Fig. 3.

gas engines are operating on producer gas, using flywheel effects large enough to reduce the natural frequency below the lowest forced frequency.

Direct Current Motor Advocated.

GANO DUNN: In the early days when direct current motors were applied to steel mills, their duty was regarded as intermittent. Their continuous capacity then was low, but their intermittent capacity was extremely high. So great has been the progress in the evolution of steel mills, that this type of motor, originally designed for very intermittent service, has come to be the modern mill motor, subjected to a service that is more severe than continuous service, a service in which through rapid reversal and the encountering of enormous inertias, the duty on the motor is even greater than that corresponding to constant continuous load. Of course the adoption of very large units for roll driving meant alternating current motors. Had direct current motors been desirable for the great rolls they could not have been used, because the sizes are beyond the limits of direct current design. The general judgment of everybody is that the adoption of alternating current in the Gary plant for the major part of the distribution has been a success. The battle may wage a little about the choice of current for auxiliaries and small distributions, and in this connection I am particularly interested in what Mr. Shover said of the desirability of an induction mill motor. He wanted an induction mill motor that would be as much better than the ordinary induction motor as the direct current mill motor was better than the ordinary direct current motor. An induction mill motor that is as much better than the ordinary induction motor as the direct current mill motor is better than the ordinary direct current motor, is still not as good as the direct current motor.

It is the advantages of generation and distribution that have brought the induction mill motor to the front, not good qualities in the motor itself. The low power factors, the necessarily small air gaps, the complexity attending the use of three phases with at least two sets of controlling apparatus, the great reduction in capacity for a given weight of motor—all in the end are bound to indicate that the problems of distribution ought not to be controlling to too great an extent, and ought not to cause the locating at every point around the mill where power is used, of the complications that attend an in-

duction motor, but should rather lead to the collecting of such complications into a substation or power house where a motor generator taking power from the main alternating distributing system will transform it into simple and powerful direct current to be sent out for local service. It is my opinion that in the end our steel mills will not be supplied throughout with alternating current, but will find themselves equipped with mixed systems of distribution—alternating for the great powers and big motors, and direct for the cranes, reversing motors and other motors of similar service.

Early Mistakes in Electric Drives.

When the mill men first started electrical equipment they were not in touch with the electrical men and many mistakes were made. They were accustomed to steam engines and the measurement of power by indicators. On account of the difficulty of doing it, no one thought of measuring the power absorbed in accelerating. When motors were first used accelerations were not yet vital items, and many of the mistakes and failures of electric motors in steel mills have been due to the neglecting of the vast amount of power absorbed by the inertia of moving masses. The railroad men went through all this and developed speed time curves. Some of the most beautiful features of the Gary equipment are due to the appreciation on the part of the engineers of the characteristics of acceleration loads.

When I see how completely the steel industry has capitulated to the electrical engineer in the Gary plant I am filled with joy, remembering the attitude of the steel men toward electric motors not long ago, even on such innocent things as roll tables. If the steel industry has capitulated to the electrical engineer, it is also true that the electrical industry has been developed by the requirements of the steel men and has received the biggest kind of dividends from this development. It used to be said that electric railroad duty was the severest known to electric motors. It does not begin to approach in severity steel mill duty, and the modern mill motor, together with the great induction motors driving the rolls at Gary, indicate how the electrical engineer has responded to the steel mill demands.

Difficulties With Reversing Mills.

WILLIAM T. DEAN: Mr. Shover spoke very briefly on some of the problems which have been met; that is,

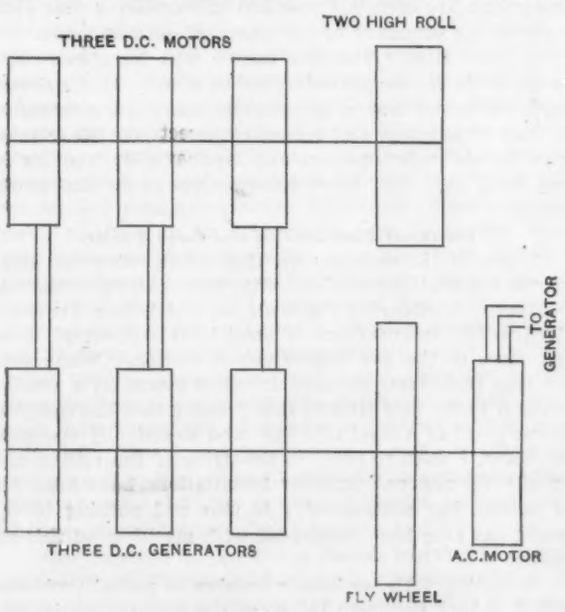


Fig. 4.

whether the mill shall be two high or three high. A three-high mill is one having three rolls, each of which rotates constantly in one direction; that is, the upper and lower roll rotate in the same direction, while the middle roll rotates in the opposite direction, as indicated in Fig. 1.

A piece of steel, for instance, passes through the lower set of rolls at A to the right, the table is then raised and it passes through the upper set at B to the left. On the two-high mill where the steel must pass back and forth through the rolls, as indicated in Fig. 2, it is obviously necessary to reverse the direction of the rolls, and therein comes the difficult problem in electrical drive, especially when large motors are used. The mill must reverse quickly to prevent delay, and in this very serious problems are encountered.

Mr. Dunn mentioned the use of direct current motors on the rolls which, in some instances, may be as large as 6000 hp. Such a motor would be extremely difficult to design, but if it could be designed it would be a very expensive machine. A plan worked out in Europe, where direct current motors of large sizes are used on reversing

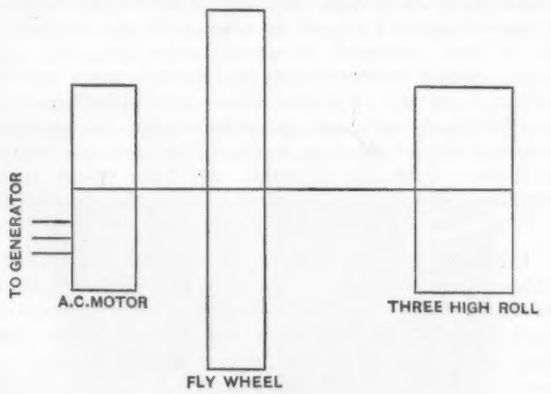


Fig. 5.

rolls, is to put three armatures on a common shaft, thus reducing the inertia on account of the diameters being smaller than of only one armature of large diameter were used.

Fig. 3 represents three direct current motors, the armatures of which are mounted on a common shaft. As the mill reverses, it is impossible to take advantage of the mechanical value of flywheels; the enormous peak loads on reversal, therefore, are reflected back in the direct current system, and to overcome this diifficulty the three direct current motors are electrically connected with two or three generators which are driven by an induction motor with a heavy flywheel, the generator armatures, motor armature and flywheel being on a common shaft, as shown in Fig. 4.

If now it were possible to use a three-high mill instead of the two-high mill, the system becomes considerably simplified, inasmuch as the direct current motors and generators can be omitted, and the induction motor can be directly connected to the rolls, as indicated in Fig. 5. The induction motor with its flywheel will do the work on any equipment, and the difference in first cost is just about one to three. This is one of the problems which I think has been solved in connection with study of the Gary plant, it being first proposed to install a two-high mill, but after careful study it was found that the three-high mill could be used at about one-third the cost of the two-high equipment and with a large elimination of troublesome features.

It may not be apparent why a mill should have ever been made two high. The steel business has been a gradual growth, the first steel being run through rolls driven by steam engines. The very first plan was to use small engines, which were reversed at each pass, this practice having gradually grown to the larger work. Some of the older steel men do not believe, for instance, that universal plates can be made in any other than a two-high reversing mill, but some plants have demonstrated that they can be made in three-high mills, and by so doing have greatly reduced the problems of electrical drive.

On the subject of small alternating current motors versus direct current motors for driving auxiliary machinery in steel plants, I will refer to Fig. 6, which represents a small direct current motor driving a roll table. In a system such as is used at Gary this direct current motor receives its power through a motor generator set, the generator being driven by an alternating current motor, which in turn receives its power from the alternating current generators in the power station. If now an alternating current motor were used on the roll table

instead of the direct current motor, the motor generator set could be omitted by connecting the alternating current motor direct to the power station through transformers, if such are necessary. After all, simplicity of general construction, as well as a general cheapening in the cost of the construction, are highly important features.

Surplus Gas Power.

BRENT WILEY: Regarding the question of surplus gas power over and above that required by the furnace auxiliaries, a review of data obtained from several of the principal blast furnace plants abroad shows that the capacity installed per 100 tons of pig iron produced in 24 hr. does not exceed 1500 hp. The average pressure is approximately 8 lb. and the amount of coke burned per ton of iron produced is approximately 2400 lb. The author gives a surplus of 3000 hp. per 100 tons of pig iron produced per day. I would like to have his opinion of a practical figure to use in this relation for comparatively small plants of more than two and less than six furnaces of modern type and capacity. My idea would be an average of the two values given above—that is 2000 hp.

Electric Ore Unloaders.

Referring to the subjects of ore unloader and ore bridge, I wish to submit data on power requirements of machines similar to those described, and which are located at the Lorain works of the National Tube Company. Two of the unloaders have a total of 475 hp.; two machines a total of 525 hp., and are of 10-ton capacity,

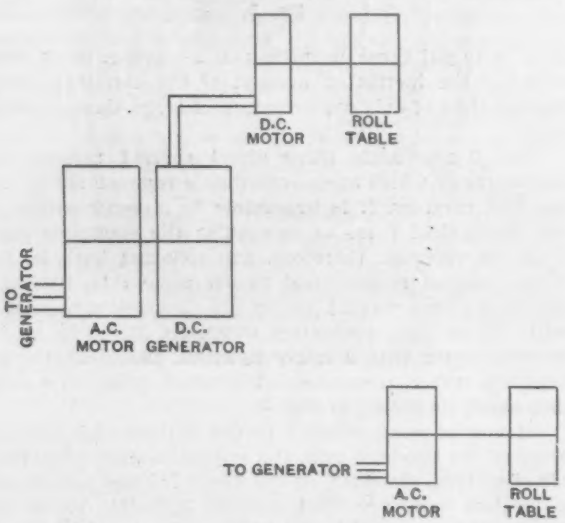


Fig. 6.

and the bridge has a total of 500 hp., its capacity being 12 tons.

One unloader, maximum current 1200 amperes. Average current 500 amperes.
Two unloader and one ore bridge, maximum current 3300 amperes. Average current 1520 amperes.
Four unloader and one ore bridge, maximum current 6000 amperes. Average current 3500 amperes.
The voltage is 220.

With the older methods of unloading ore, where hand labor is employed to fill the conveying buckets, the unloading price per ton ranges from 12 to 18 cents, and for the boats of modern design, ranging from 8000 to 1200 tons burden, it would require several days' docking. Machines of the above mentioned type have reduced both the handling price and the holding time of the ore boats at the dock fully 75 per cent. This is a good illustration of the advance that has been made with the development of the auxiliary steel mill machinery, and motor application has been one of the prime features.

Economy of Electricity in Steel Works.

The principal point of the universal application of electric power in the steel industry is the commercial value, and this is made up of a number of items, some of which relate to the subject only indirectly. A summation of the advantages of the electric drive will bring out the questions that should be considered:

1. More reliable, less breakage of couplings, pinions, &c., with a correspondingly less maintenance cost.
2. Low power cost, with the following advantages: Centralizing of power equipment, low fuel cost, use of gas engines of medium size in power stations, uniform load conditions in power station engines by equalizing methods.
3. Less space on account of absence of boilers, pipes, &c.
4. Easy adaptation to mill machinery.
5. Easy distribution by means of cables, instead of steam or gas pipes.
6. Easy and simple handling with reliable protective features of control.
7. Less labor.
8. Less oil and other stores.
9. Ease of obtaining power indications and records.
10. Constant and regular torque.
11. Increased output due to higher and more uniform speeds.

Referring to item No. 9, economical conditions can be worked out and modifications made with a knowledge of results based on exact information, having available power indications and records which do not exist with the use of steam engines. Again, power indications are of valuable assistance in locating faults of machinery, a timely discovery of which prevents loss of time and material and probably damage to mill. The disadvantages mentioned by some engineers are high capital outlay and loss of efficiency due to two intermediate machines between source of power and point of application.

Taking all of the above items into consideration, however, the results are decidedly favorable to the electric drive, especially for new plants; and it will be found that there are comparatively few cases of existing plants where the conversion from steam to electric drive is not worthy of the fullest investigation. This point is emphasized by the very active interest taken in the exhaust steam turbine proposition by a majority of the large steel companies. The exhaust steam from the existing mill steam engines is used to drive a low pressure turbine connected to a generator, which in turn furnishes electric power for the mill motors. Within the past two years the steel companies of the United States have installed more than 200,000 hp. of gas engines and turbine electric station equipments, to drive approximately 15 motor units aggregating 20,000 hp., exclusive of 13 units of the Indiana Steel Company now operating and on order and aggregating 51,700 hp.

Within a year or so the data obtained from the above installation should give a conclusive analysis of the electric drive from both an actual and comparative cost standpoint, and while it is scarcely probable that this information will be available in detailed form, the electric companies are certainly justified in requesting that a review of the summary of the compiled data be made.

ROBERT HULL: The gas engine will have more and more to do in the manufacture of steel. An important question in the case of gas engines operating alternators is that of hunting, and I would like to have Mr. Shover give us his experience on any trouble with hunting he has had, and also some information as to the power factor.

Unusual Features of the Gary Plant.

DAVID B. RUSHMORE: In this plant, with its many varied applications of electricity, two features stand out distinctly, considering the scale on which they are practiced in the manufacture of steel in this country. I refer, first, to the gas engine power station. While such stations have been installed in other places on a smaller scale, it is the first time in this country that the complete power plant of a steel mill has been electrically operated. Secondly, I wish to refer to the drive of the rolling mill by electric motors. Smaller installations have been put in before, but nothing of this size and nothing in the world has ever been attempted with machines of this capacity.

In rolling mills we have a number of varied problems, and it is very pertinent to repeat the remarks of the previous speaker to the extent that under no other conditions of service are the requirements of the electric motor as severe as they are in this work. The load curves we saw this evening on the auxiliary as well as on the main roll drive, indicate a load condition not met with elsewhere. This necessitates in the motor a very unusually strong mechanical construction and an interesting mechanical device mentioned by the author; it necessitates a comparatively large air gap in the large machines, and also in smaller machines, making the design of the ma-

chinery, electrically and otherwise, with the idea of reliability first.

The author has very interestingly brought out the point that what a steel mill desires is nothing but the maximum output of steel, and the incidental features of the design must all be kept with this in view. That means that the electric motors have a considerably larger air gap than was necessary from any other consideration; that the factor of safety, electrical and mechanical, very much exceeds the figures that would be used for any other class of service, and, as he saw, in regard to the overload capacity of these motors; no variation in temperature of ingots should be able at any time to stall them. This is illustrated in the new type, where all the mills operate continuously in the same operation and all the motors are equipped with flywheels.

The design of a flywheel and the motor, with the automatic control, in order to have the motor properly function with its variation in speed, to draw the proper amount of energy from the flywheel and throw back on the power station the desired load has been one of the very interesting problems of this work. Other engineers connected with the Steel Corporation have been studying, and have worked out with a very considerable degree of refinement, the load thrown on the rolling mill by the reduction of the steel passing through it. This has been done, to a large extent, by the indicating steam engine, and now with the beautiful accuracy possible with the electric motor, a much more refined study of this problem will be possible.

The question of the alternating current motors is a very vital one, and I wish to speak of it in connection with another engineer who has done a large amount of pioneer work for the Illinois Steel Company, and who is going to be the pioneer in introducing through the system which he is operating, high speed rotary condensers, which entirely take care of the power factor, and the effect of the peak on the generating station, and which will allow in this plant, and the other plants in which they will be used, all the advantages of the electric motor, with the power factor obtainable, with that of zero frequency, of which we have just heard.

Difficulties in Paralleling Gas Engines.

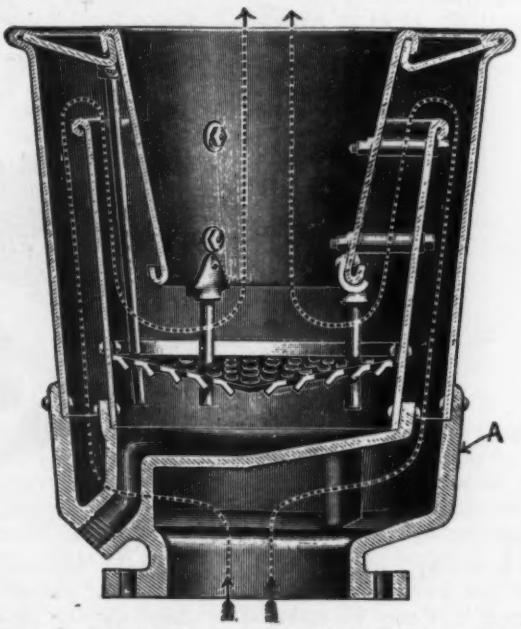
MR. SHOVER: Mr. Hull's question raises a doubt. We have had some slight difficulties in paralleling the gas engines; the trouble, however, existing only at times of light load. The operation of the alternators in parallel, under three-quarter load or more, is in the main as steady as are any reciprocating steam engine driven alternators. On lighter loads there is always some inclination to hunting, due to the inherent characteristics of the gas engine, in that there is always one cylinder which is a little stronger than the other, that is one end of one cylinder, and always one cylinder which is a little bit weaker than the others. Therefore, when you come down to the light load, you may come to a point where this weak cylinder misses fire, in which case it will be noticed that the needle on your ammeter on the switchboard will show it. The strokes of the engine can be counted at that time. There is also the strong cylinder, and if there is a light cylinder and this heavy cylinder, going exactly opposite to each other, then we do have more or less trouble with the machine. I have never seen them throw out of step, even under the very worst conditions, but I thought they were going to. The reason why it seems almost impossible to overcome these inherent characteristics of the gas engine, I do not think it is necessary for us to take up here.

The question of the power factor which was brought up is one which was held up as a scarecrow for a long time; in fact, our attention was called to that to such an extent, we ceased to shy at it any more. We did not know what our power factor was going to be in this plant; we had no way of finding out, and we finally came to the point where we did not care what it was. The only thing we could do was to put the plant in, operate it, determine the power factor, and then ascertain if correction was necessary. We have not yet reached the point where we can say what we are going to do, because the heavier the load on our plant the better the power conditions, and when we get the mill full of steel, we will know what it is going to be. At present, I will say that our power factor varies according to the conditions in the mill, from 35 to 85 per cent.

The Neverust Exhaust Head.

As an improvement on an all cast iron exhaust head, Franklin Williams, 39 Cortlandt street, New York City, has produced one made of copper and cast iron known as the Neverust. By making it larger than usual and of heavy gauge copper it is claimed to have a better efficiency than a cast iron head and to be lighter, although of equal, if not greater, durability. On account of the comparatively low weight of copper used and the small amount of labor required in its construction it can be sold at a moderate price.

The action of the head in the separation of moisture from the steam before it is discharged can be understood from the sectional view herewith. The steam in passing through the head takes the course indicated by the



Sectional View of the Neverust Exhaust Head, Made by Franklin Williams, New York.

dotted lines. At A the cast iron base of the head is extended upward so that the steam current where it changes direction will not wear away the metal, as would be likely were the metal of thinner section in this zone; at the top, where the other changes of direction in the flow of the steam occur, the steam has expanded and there is not this tendency. The cone directly over the top of the exhaust pipe which takes the blow of the steam is in one piece with the base of the head and the whole is a substantial casting. The top of the head is arranged so that any water settling upon it drains to the lowest point and through a pipe to the water chamber and from there out of the head. When it rains this part of the head is flushed out, and since the drain passage is very large no cleaning is necessary. The Neverust exhaust heads are made in 23 sizes for exhaust pipes, ranging from 1 to 20 in. diameter.

The Brazil Machine & Foundry Company, a consolidation of the Ideal Iron Fence Company and the Adrian Brick & Tile Company of Adrian, Mich., has recently completed and is now operating a plant at Brazil, Ind., manufacturing wire fencing machines and clay products machinery. The works occupy a building 75 x 200 ft., half of which is two stories high.

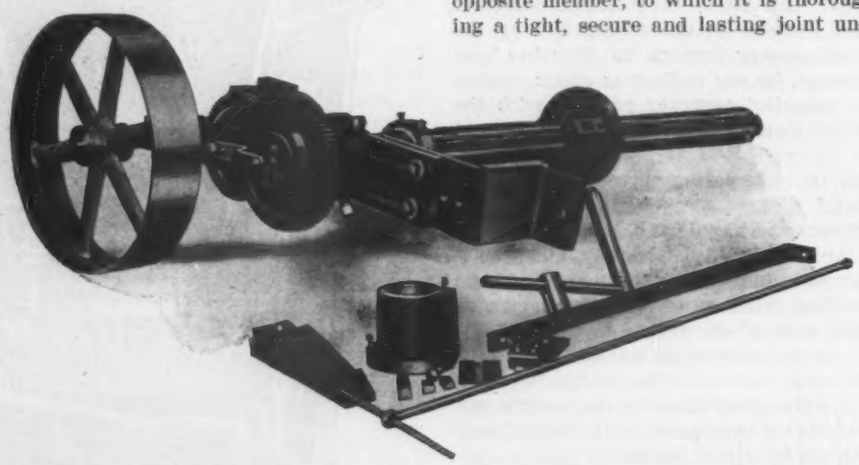
Work on the new by-product coke ovens which are to form a part of the Indiana Steel Company's plant at Gary, Ind., has been begun. The first unit to be installed will consist of 560 ovens, with provision for a like number to be added later on.

The Nappanee Portable Boring Bar.

The chief features of the portable boring bar just placed on the market by the Nappanee Iron Works, Nappanee, Ind., are strength, compactness and simplicity of construction, combined with moderate cost. The driving mechanism is so grouped on the frame with relation to the boring bar that it offers the least obstruction to its use in cramped quarters. It can be applied to any cylinder where there is room enough for the removal of the cylinder.

The arms provided for fastening the machine to the cylinder are adjusted to the different diameters within its range by means of slots in the head frame to which they are bolted. To secure absolute rigidity the steel feed screw is set in the bar and is fitted with a brass feed screw cut with an eight-pitch square thread in such a way as to insure maximum wear.

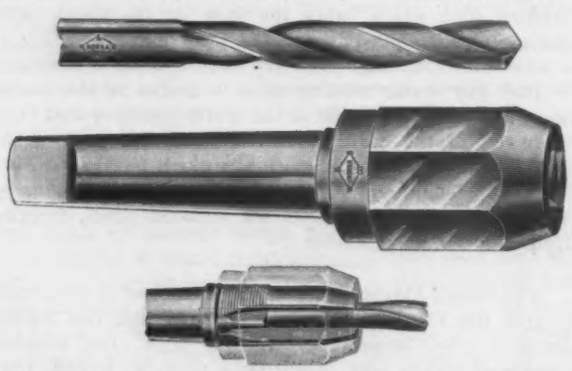
The tool is made in three sizes. No. 1 has a bar 42 in. long and bores cylinders from 4 to 12 in. in diameter by 32 in. long; Nos. 2 and 3 are equipped with 72-in. bars, boring cylinders 7 to 24 in. and 7 to 36 in. in diameter, respectively, by 54 in. long. Each size is furnished with the necessary cutter heads, arms and tools required to bore the given diameters. The machine is powerfully geared, and may be operated by hand as well as mechanical power.



A Portable Cylinder Boring Equipment Made by the Nappanee Iron Works, Nappance, Ind.

New Norka Drill and Chuck.

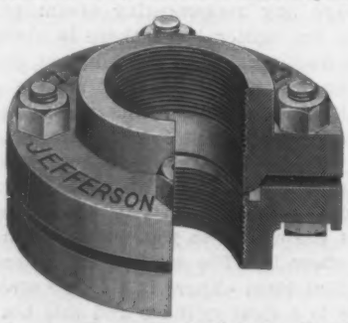
The Norka two-grooved high speed twist drill and a chuck for holding it are new products of the Whitman & Barnes Mfg. Company, Chicago, Ill. The drill is made of high speed steel of special analysis, which experience has proved to be of the necessary hardness to stand a great amount of high speed work, retaining at the same time the required degree of toughness to minimize splitting and breakage. Being twisted hot it is claimed that the grain of the steel is not disturbed in any way, and its strength is, therefore, not impaired by this process. The elimination of the tang is an important feature of the drill. In forming up the tool, a section of the stock is left untwisted, and this forms the shank of the drill, which, being grooved, furnishes a tight grip for the jaws of the chuck, which are shaped to perfectly fit the grooves. Being perfectly ground the drill is not only held securely in the chuck, but is also accurately and automatically centered, and as it is ground to size can be relied upon to do accurate work. The Norka chuck used in connection with the two-grooved drills is securely locked in the jaws by a heavy clamping nut. The jaws are ground and hardened and are carefully finished to conform to the shank grooves into which they fit.



The Norka Two-Grooved High Speed Drill, Its Chuck, and Phantom View Showing the Grip of the Chuck on the Drill Shank.

A Jefferson Heavy Flange Union.

The Jefferson Union Company, Lexington, Mass., has brought out a new flange union, shown in the illustration, designed for heavy work. It is made of the best air refined furnace malleable iron. The patent seat is cut from drawn brass tubing, so that it is free from the sand and blowholes common in cast brass. The seat is forced into an annular recess under great pressure, after which a spherical seat is cut to receive the ball face of the opposite member, to which it is thoroughly ground, making a tight, secure and lasting joint under pressure running as high as 3000 lb. It will be seen that the brass ring is set in the iron away from the inner bore of the fitting, so that it is unaffected by different temperatures in the pipe, and consequently looseness cannot result from the influence of contraction and expansion of the two metals. In applying the union it makes no difference if the pipes are not in perfect alignment, for the joint is spherical and will adjust itself, even if the pipe is out of line several degrees. The fitting is manufactured in all sizes from 1 to 10 in.



A Flange Union for Heavy Work Made by the Jefferson Mfg. Company, Lexington, Mass.

From statistics which have just been compiled by William Hanhart, secretary of the savings bank section of the American Bankers' Association, it appears that the "banked" savings in the United States amount to $5,500,837,016, as against the report of the Comptroller of the Currency showing only $3,660,553,045. Including the savings in building loan associations and life insurance companies, Mr. Hanhart places the actual and visible savings of the people at the enormous total of $9,466,411,488, or over $118 for every man, woman and child in the country.

New Jersey I-Beam Trolleys.

The illustrations herewith show two new trolleys which have been recently added to the line of overhead carrying apparatus manufactured by the New Jersey Foundry & Machine Company, 90 West street, New York City. One of these, Fig. 1, is traveled on the I-beam by pulling the load chain itself, and the other, Fig. 2, is fitted with a geared chain pull traveling device. The trolleys were designed to meet the requirements for a first-class, yet inexpensive, trolley which is adaptable to varying conditions. The side plates are of steel, and the connection is such that a minimum head room is obtained, allowing the hook of an ordinary chain block to come close underneath the I-beam.

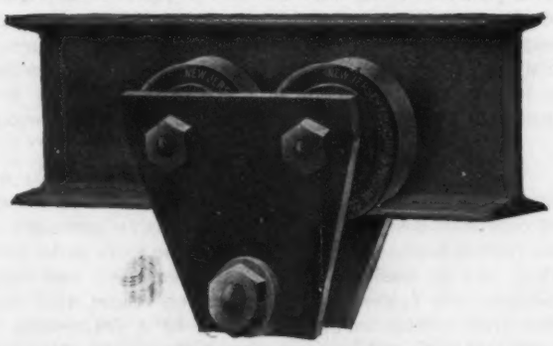


Fig. 1.—Plain Trolley.

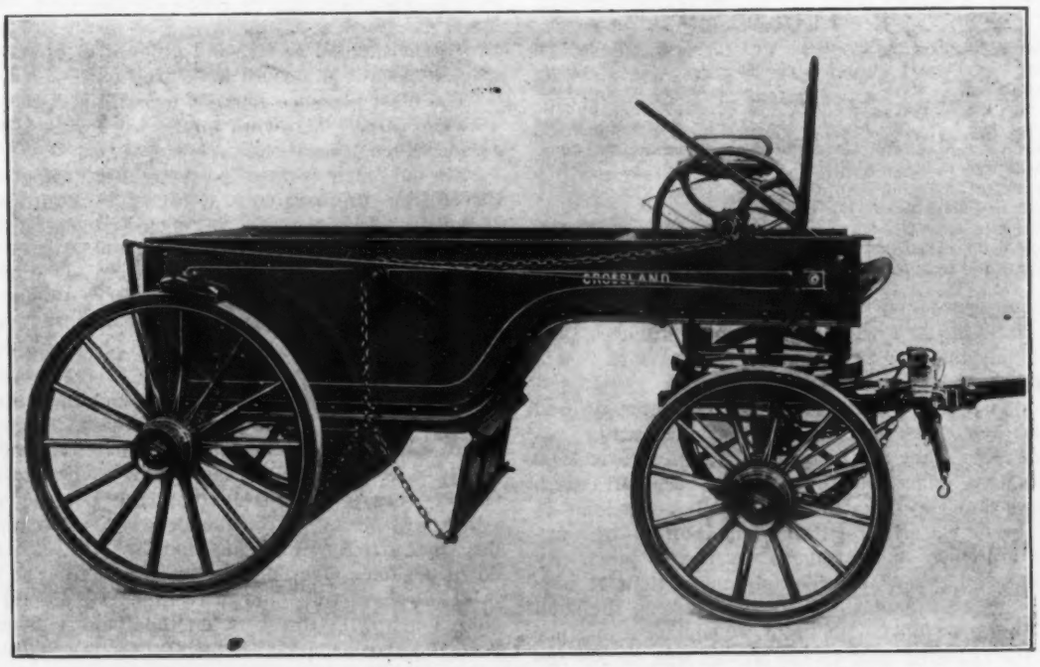
Fig. 2.—Hand Traveling Trolley.

Two New I-Beam Trolleys Made by the New Jersey Foundry & Machine Company.

The trolley wheels are fitted with roller bearings and are inclined so as to run true on the lower flanges of the I-beam. The gauge between the wheels is obtained by beveled washer separators, and by using filler washers the trolley can be fitted to run on any one of three sizes of I-beam, requiring only a few minutes to make the change.

The Connellsville Steel Dump Wagon.

An extremely durable contractor's dump wagon, the body of which is entirely of steel, is made by the Connellsville Iron Works, Connellsville, Pa. The box is of sheet steel of No. 10 gauge throughout, except the doors, which are 3-16 in. thick, so that it is practically indestructible. It weighs less than the lightest wood wagon and it is claimed to be stronger than the heaviest. By virtue of the form of the box it is declared that the load will not stick, no matter what it may consist of, but will dump easily and completely. The body of the wagon is mounted low down between the wheels, making it easy to load. It is also said to be the shortest coupled wagon made, the wheel base being only 7½ ft., which renders it an easy wagon to haul, and allows of its being used in cramped places where the ordinary type of wagon could not be used.



A Steel Body Contractors' Dump Wagon, Built by the Connellsville Iron Works, Connellsville, Pa.

In the illustration may be seen something of the manner by which the wagon is operated, which is extremely simple, so that there is little to get out of order. The doors are held by chains passing over pulleys and leading to a windlass, which consists of a 2-in. pipe roller which is operated through a 24-in. hand wheel, with ratchet and pawl attachment. By means of the lever shown in front of the wheel the pawl is released, allowing the load to be dumped. The vertical lever controls the brake, as is plainly shown. The fifth wheel of the wagon consists of circular plates, 2 x ⅝ in., by 30 in. in diameter, and are steel, as are also the pole and whiffletrees. The wheels are of wood, being the only wood part in the wagon except the seat, and have a 3 or 4 in. tread, with 2½-in. spokes. The axles are solid steel, 2¼ in. in diameter. To stiffen the body of the wagon 2¼ x 2¼ x 5-16 in. angles are used all around and in all corners. The drop doors are made to dump either lengthwise or crosswise, as the purchaser may elect. The wagon can be hauled by a traction engine if desirable, and it is claimed that it will not become loose or dilapidated after a long period of operation.

The Omaha Electric Show at Omaha, Neb., has been successfully lighted from a wireless telegraph station at Fort Omaha, five miles from the building. Some 4000 incandescent electric lamps were thus operated. The feat was accomplished by Dr. Frederic Millener, formerly of Buffalo, N. Y., but now wireless electrical expert of the Union Pacific Railroad.

Continuous Melting in the Foundry Cupola.*

BY RICHARD H. PROBERT.†

In the continuous melting of iron in our foundry we operate two cupolas alternately. They are situated side by side, midway and at one end of the molding floors. They were made in our own shops, are drop bottom and of the same size and type. Their dimensions are as follows:

Hight over all	30 ft. 6 in.
Inside diameter (lined)	30 in.
Size of charging door	1 ft. 6 in. by 2 ft. 4 in.
Five tuyeres, each	4 x 5 in.
Air or blast box	6 in. by 2 ft. 4 in. high.
Melting zone is 8 in. above the tuyeres and extends up for	20 in.
From the bottom to charging door	9 ft.
From the top of charging door to top of stack	19 ft.
From bottom to slagging hole	12 in.
From bottom to tuyeres	20 in.
Outside diameter of stack	42 in.
Outside diameter from charging door to top of air blast box	56 in.
Outside diameter from top of blast box to base	68 in.

The stack is lined with regular stock firebrick, and from the charging door to the bottom is lined with cupola blocks 4 in. thick, 6 in. wide, 6⅞ in. inside radius and 9 in. outside radius. These blocks and the fireclay used with them are of the best make, from which we get excellent results. They are guaranteed to stand over 3000 degrees F., are dense, hard, tough and very refractory, made from flint clay high in alumina. It is economy to use high grade material for lining from bottom to charging door, especially on continuous melting, as previously the repairs were very considerably more than it now costs, in fact, over double. The space between the shell and the lining is filled with grout. The last lining put in from the charging door to the bottom was on November 2, 1907, and it is still in good condition.

Charging and Melting.

In addition to our continuous melting we make gray iron castings for machine, structural and other lines of work, which is put up on the regular sand floor. These castings are poured each morning before the continuous work is begun. The night watchman lights the cupola at 6 o'clock a.m., everything being got in readiness the previous evening. The first iron is tapped out at 7.20 to 7.30 a.m. The first charge of coke to heat up and form the bed amounts to 500 lb. We previously charged 900 lb. but successfully reduced it. Our charges are small in comparison with those of general foundry practice, but, owing to the nature of the work and the continuous melting, the charging of the cupola and frequency of the metal tapped out, all requires nice adjustment to prevent loss.

The charge consists of 100 lb. of coke and 500 lb. of iron (about as follows: 100 lb. machinery scrap, 250 lb. pig and 150 lb. remelt). The last three coke charges are usually 50 lb., 50 lb. and 25 lb. Limestone will average about 2¼ per cent. to the total iron charged. On a day's run of 20 charges, lime rock is commenced with the fifth heat and stopped off on the fifteenth. This has been closely followed up and no difficulty is experienced. The loss in melting is about 2½ per cent., deducting the finished castings and scrap cleaned up from total iron charged. Slagging commences regularly about 11 a.m. each day.

Cupola Details.

We daub up the cupola with swamp or blue clay mixed with fireclay. The melting zone and bosh is repaired with 1 part swamp clay and 2 parts fireclay, with small crumbs of firebrick.

Sand bottom is made up from the siftings of the previous bottom, tempered with three shovels of new molding sand, slightly dampened and riddled. The bottom is stamped and rammed close with a close joint of fireclay around the edges. We make up the bottom as dry as possible, which is the best practice for small heats, as it does not chill the iron when first melted. The thickness is 3½ in. at the level of the tap hole and slopes to 4¾ in. thick at the back; this will give a slope of ½ in. to the foot. Figuring inside measurements, the slag hole is 8 in. above the sand bottom, from the slag hole to the bottom of tuyeres is 9 in., and from the top of tuyeres to the bottom of melting zone is 8 in., with melting zone extending up about 20 in.

The breast is made with a firebrick, chipped, grooved and beveled on the inside to 1 in. in thickness at the bottom side. The groove forms the tap hole; this brick is set in place with fireclay. The spout is lined with two firebricks end to end and grooved or channeled out, fitted and daubed smooth with fireclay.

The blast pressure equals 6 oz., and is regulated with a swing valve. The wind intake is 10 x 10½ in. = 105 sq. in., which exceeds the tuyeres 5 sq. in.

All our coke is kept perfectly dry, being unloaded direct from the cars into storage bins built inside the foundry at the foot of runway to the cupola. It analyzes as follows:

	Per cent.
Volatile matter	0.67
Fixed carbon	87.05
Ash	10.60
Sulphur	0.74
Phosphorus	0.016

It is very important that the molding frames and molds be kept up to the highest state of efficiency, so as not to cause delay in the pouring and the holding back of the iron in the cupola. The frame and mold capacity should always be greater than the pouring capacity, which will permit of continuous work. The cupola tender must strictly watch his charges. He must not melt down too fast. The blast must be regulated so the heat is at all times fully known to him. He should keep in close touch with the work on the foundry floor and be ready to give or slack his metal as it is required by the men. Good common sense and strict attention to his duties are required to prevent chilled heats, overheating and other losses. Slagging commences regularly each day about 11 a.m. The slag is allowed to accumulate until just below the tuyeres. Our experience is that by leaving the slag to this hight we get cleaner iron and better results from the blast. We open the slag hole just enough to let the slag run, and by letting this gather in a crust on the outside of the slag hole it acts as a trough and prevents the blast escaping out with the slag.

Molding Frames.

The molding frames for the permanent molds are either square or rectangular in form, but should always be carefully designed so the molds can be arranged on the frames to the best advantage for the work to be done. They can be made with flat bar iron cross and intermediate bars fastened to the cast iron frame with solid cast iron trunnions on each side, or a framework of angle iron with cast iron trunnions bolted to the sides with flat bar iron cross pieces to the angle of the framework. This makes a much stronger frame. The molding frames are supported on cast iron stanchions set securely in an upright position in the molding floor. The top of each stanchion is made with an open bearing or journal fitted up to take in the trunnions on the ends of the molding frames. This allows the molding frames to revolve freely on the trunnions, as in operating a number of molds on one frame the pouring of the molten iron can not always be done from the same side of the molds, as the gates do not run in the same direction. The revolving frames can be turned to the best position and quickly fastened in place with a plain steel pin set into holes drilled in the end of one of the trunnions to a lug or bracket on the stanchion below the bearing. For some work the molds on one side of the molding frame are much heavier and larger than those on the other side, which causes the frame to be top heavy and difficult to handle. This can be easily overcome by an arrangement of counter weights adjusted so as to properly balance the frame. A circular revolving molding frame is very convenient and can be worked to advantage on standard lines of duplicate work, in which the molds are self-contained and separate unto themselves. Such an arrangement would permit of the iron pourer getting around his work

* Read at the Cincinnati convention of the American Foundrymen's Association, Cincinnati, Ohio, May, 1909.

† Superintendent of the Dow Iron & Wire Works, Louisville, Ky.

quickly, besides leaving sufficient room for more than one man to pour iron on the job at the same time.

Permanent Molds.

Our permanent molds are largely ornamental. Some of them are made to hinge and are provided with a swivel clamp set into a lug on the side of the mold for fastening the two halves together. Others are not hinged and are fastened together with screw clamps or gib and key. Any arrangement made for the fastening of the mold together should be made so that it can be taken apart easily and quickly, as it is necessary to open up the molds as soon as poured, in fact, while the casting is at a very bright red heat.

Castings that are unequally proportioned and uneven in their different parts will crack open and chip if allowed to cool in the molds. The molds are machined on the faces that close together, so as to make a tight, even joint; they are also machined on the bottom side that is bolted to the molding frame. They are drilled and tapped with the hinge pin properly fitted, so it is necessary to have them soft enough to permit of this machine work and fitting being done and still be tough enough and of the right grade of iron to stand up to the molten metal continuously poured into them. If they fail to do this and burn out quickly it is quite a loss due to delay in producing the work and the expense of remaking the molds. After some experimenting the writer found that molds with the following analysis gave fair results:

Silicon.	Sulphur.	Phosphorus.	Manganese.	Combined carbon.	G. C.
2.15	0.086	1.26	0.41	0.13	3.17

Molds made from iron with this analysis were worthless:

Silicon.	Sulphur.	Phosphorus.	Manganese.	Combined carbon.	G. C.
3.30	0.057	0.67	0.12	0.19	2.98

Molds that gave the best results were made from two special brands of No. 2 foundry pig, heavy machinery scrap and our regular No. 2 foundry pig. The special irons analyzed as follows, the first being strong iron and the second fluid iron:

Silicon.	Sulphur.	Phosphorus.	Manganese.
1.50 to 1.75	0.015 to 0.03	0.18 to 0.20	0.60 to 0.90
2.25 to 2.75	0.015 to 0.03	0.40	0.45

The 525-lb. charges were made up from:

150 lb. of strong special.
75 lb. of fluid special.
100 lb. of our regular No. 2 foundry pig.
200 lb. of heavy machinery scrap.

The analysis of the molds cast from this mix was:

Silicon.	Sulphur.	Phosphorus.	Manganese.	Combined carbon.	G. C.
2.02	0.07	0.89	0.29	0.84	2.76

These cast molds are easily machined and do not burn for a reasonable length of time. Extra care is taken in molding them. We have success in using a molding sand made up from

8 parts of old floor sand.
3 parts of new floor sand.
1 part of sea coal facing.
1½ parts of sharp sugar sand.

This with plumbago, a good parting and setting in the pattern again, together with careful melting by the cupola tender, has given us the best permanent molds to date.

Iron was taken from the above given charge, and 7 per cent. of tool steel turnings (fine lathe turnings) were mxed in the ladle and well agitated before being poured. The cast permanent molds from this are standing up well, but have not yet had sufficient time thoroughly to test this mixture.

Suggestions.

Continuous melting can be easily arranged for, and with an equipment of overhead runways and hoists the frames can be quickly changed. The molds on all frames can be previously made ready by the mold makers, so that very little time is lost in changing frames. It is advisable to have a few extra sets of stanchions for all preparatory work to be set up on them, thereby preventing delay.

A mixture of linseed oil and powdered soapstone or oil and graphite swabbed on the molds and gates each heat will prevent the castings sticking and prolong the life of the molds. The molds should be kept clean, and when not in use stored away on shelves convenient to the molding frames. All our molds are classified and indexed in a mold book just as with a well arranged pattern storage loft.

We use high carbon steel molds that have sharp, thin edges on their inside. In constant use the steel in these molds roughs up but does not eat away and burn off as do the cast iron molds.

By this process, with the proper mixture of metals carefully melted and well made permanent molds that will stand up to the work required of them, with instant effective pressure on the molds as soon as the molten metal is poured into them, cast specialties can be made with increased strength. The pressure will make them nonporous, more dense in structure, which the annealing would not weaken but rather toughen. Subjecting some cast specialties to pressure would make them more suitable for the finer line of machine parts, as they would be pressed into better shape, be cleaner and with their parts more clearly defined. An equipment for such added pressure can be easily made, and after first cost would be a slight expense in operation.

Government Supplies to Be Bought on a New Plan.

Washington advices state that President Taft is expected shortly to sign an executive order that will revolutionize and centralize the purchase of supplies for the Government departments. The order formally creates a Central Board of Awards, of which, it is understood, Assistant Secretary Hilles of the Treasury will be chairman.

There is such a board at this time, and it is composed of the assistant secretaries of the various departments. The work of the existing board is confined to the supervising and awarding of contracts for supplies for the various departments, but the bids for these supplies are made direct to the separate departments. The good of such a board is confined largely to protecting the departments from extortion as far as possible and no attempt has been made to centralize the purchases. In many instances the prices of certain supplies to different departments were entirely different. The Treasury Department would pay one price for coal delivered, while the Interior Department would pay another price, the haul being practically the same.

The belief of the President and the executive heads of departments is that thousands of dollars will be saved each year by the plan of centralizing bids and purchases, and it is estimated that the Board of Award will make contracts on approximately $8,000,000 worth of supplies, the amount increasing each year as the departments find themselves able to use articles of common kinds.

The Jones Central Iron & Steel Company.—Through the efforts of the Brazil Factory Promotion Club, it is expected that a merchant bar mill will soon be added to the new manufacturing enterprises which have recently been located at Brazil, Ind. The mill is to be installed by the Jones Central Iron & Steel Company, recently organized and incorporated with a capital stock of $150,000. Plans have been prepared for the works which will comprise a main building, 92 x 210 ft., of steel construction, with equipment including two roll trains, 10 and 14 in., respectively, the latter to be driven by a 500-hp. engine, the former being arranged for motor drive. Steam will be generated in two vertical water tube boilers of 250 hp. each, by waste heat supplied from two three-door furnaces. Among the auxiliary machines specified in the plans are two lever shears, one having capacity to cut 4-in. cold steel. A tract of 10 acres has been secured for the location of the plant, which will be supplied with suitable switch track facilities. Plans have so far matured that figures on building construction and machinery and equipment are being taken.

Permanent Molds for Iron Castings.*

A Summary of the Results of Recent Practice.

BY EDGAR A. CUSTER.†

Some 20 years ago the late Harris Tabor brought to the attention of the writer a machine for making brake-shoe molds. He was very enthusiastic over it, and predicted that in a very short time all the foundries would be making their duplicate work with that class of machine. He had worked at it long and earnestly, and believed that it would win instant recognition. He lived to see the molding machine field extending far beyond his wildest dreams; but it took 20 years! To such an extent has this feature of the founding art grown that to-day we have molding machines each of which costs more than the entire equipment of an ordinary foundry 30 years ago. The modern manufacturer is under the necessity of keeping down shop costs, and his constant endeavor is to substitute machines for manual labor where possible. It is this tendency that has of late years turned attention to the question of how far permanent molds may be used to reduce the cost of production. It is not a new question by any means, but the information available is very meager.

It is the purpose of this paper to give a full and free account of the conclusions formed after three years of constant work on the problem. It must be understood, however, that it deals solely with work that is applicable to permanent molds, and the statements made, and the conclusions formed, are directed only toward that branch of the foundryman's art. The subject may be taken up under the following heads:

1. Of what material should the molds be made?
2. What effect has such a mold upon the castings?
3. What effect has molten iron upon the molds?
4. What remedy should be applied for any bad effects shown?

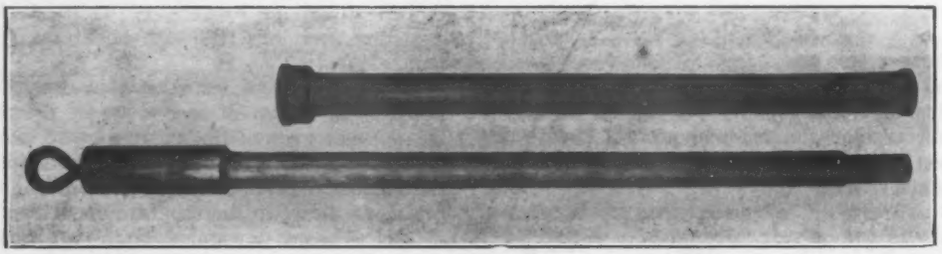


Fig. 1.—A 4-In. Pipe and Permanent Core.

Material for Permanent Molds.

The ideal material for a permanent mold would be one that would not chill the molten iron, would stand swift heating and cooling without disintegration, and would be capable of being machined or molded into the shape required. It should be very nearly as hard as iron, quick to conduct heat and of low specific gravity. A number of substances fulfill these requirements in part. Lava rock will stand the sudden changes of heat and cold, can be cut into the shape desired and does not chill the molten iron. When a coating of finely ground mica or some other inert substance is rubbed into such a mold it will give beautiful castings. But it wears away rapidly, and soon needs renewal. Were it not for this fault it would very nearly solve the problem. We found it extremely difficult to handle and prepare this substance, and this led us to seek a material that would possess both hardness and ability to stand the heat changes. Cast iron has been the favorite medium and so far nothing has been brought forward that is so well adapted for foundry work. It has the advantage of being easily machined, and the added advantage that it is formed by a process with which we are all familiar, while its possible disadvantages are more easily overcome than those of any other substance.

It is not much trouble to make and machine an iron mold, and we can calculate the expansion and contraction to a nicety. Its great drawback is its chilling effect. Some investigators make the claim that if the mold is heated to nearly the temperature of the casting when it is ready for removal, no chilling effect is perceptible; also that the molten iron should cool at the same rate in a permanent mold as it does in a sand mold. To both of these propositions I would answer that they defeat the object of permanent mold work, in that they destroy the permanence of the mold, confer no benefit on the finished product and set up a multitude of difficulties, such as core crushing, shrinkage strains and segregation.

But these two claims have been so persistently made that it seems advisable to treat them at some length. We are all familiar with the rapid disintegration of cast iron when kept at a very dull red heat—the rapid oxidization and the tendency to spawl and crack. When the heating and cooling is carried through a range of 200 or 300 degrees F.—and this must of necessity occur—the mold becomes useless in an incredibly short time. Again, the molten iron will not lie close to such a mold, and the resulting castings are far from perfect.

It has been conclusively demonstrated that mold distortions due to heat become permanent after a temperature of 900 degrees F. has been passed, so that highly heated cast iron molds seem to be out of the question. While there is no doubt that they would prevent chilling, the cost of such a method would be prohibitive. Should the iron cool at the same rate in a permanent mold as it does in sand? The answer to this is most emphatically in the negative. The effect on the mold would be the same as maintaining it at a high heat, and the time lost in cooling would slow the process up materially. Slow cooling would not improve the casting, nor would it prevent segregation. It would induce shrinkage strains, and, in fact, would be no improvement over the present sand casting method, except that it would obviate sand ramming.

Effect of the Mold on the Casting.

When we first contemplated using permanent molds it was considered a foregone conclusion that, unless the interior of the mold was heavily coated with some inert substance, the casting would necessarily be chilled, and extensive arrangements were made to prevent or to remove this chill. For a time the molds were carefully coated after each pouring, but in our efforts to gain time this coating was neglected, and we noticed that even when this was the case no chill appeared, provided the casting was removed above a certain temperature. Following this lead we found that when the surface of the mold was practically free of any coating, no gases were formed by contact of the molten metal, and that chill could still be prevented by removing the casting at the proper temperature. Once these facts were thoroughly established all our attention was centered on the possibility of removing the casting as soon as it was set. A

* An article by Mr. Custer, describing his method of casting soil pipe in permanent molds, appeared in *The Iron Age* of April 16, 1908, p. 1227.

† President Tacony Iron Company, Tacony, Pa.

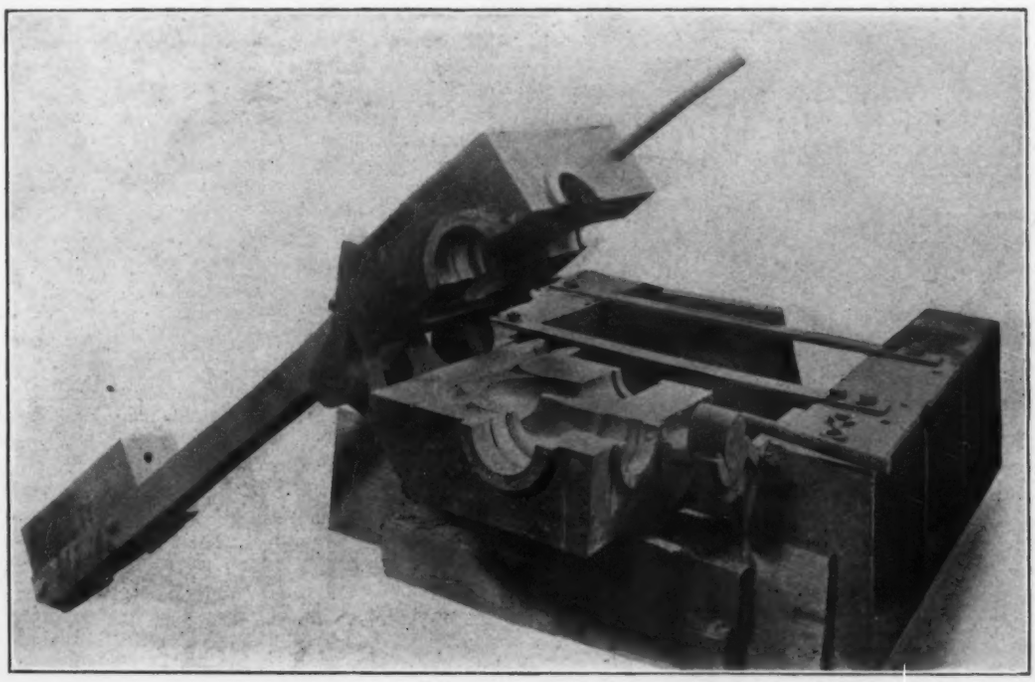


Fig. 2.—A 4-In. Trap Mold. Weight of Trap Casting, 42 Lb.

few trials proved beyond doubt that molten cast iron does not chill until after the casting has set, and it was simply a question of reasonably quick work to produce castings not only perfect in form and texture but answering all the requirements for high-class marketable work.

The next step in this line of reasoning was that if the contact with comparatively cold iron on one side did not necessarily chill the casting, then contact with iron on both sides need not chill it. To demonstrate this point several thin sheets were cast between heavy plates and removed without chilling. This suggested the possibility of using metal cores, provided these could be removed before being caught by the shrinkage and immovably held or the casting cracked. Reasoning that cast iron does not contract until after it is solid, we believed that it would be possible to remove a core before such contraction occurred. This was tried first on the T-shaped fitting, the entire core being made of cast iron, in two parts, one part for the main body and one part for the branch. These core parts were fitted to the mold and metal was poured around them, and it proved to be not only possible but very easy to withdraw the core, provided it was done when the casting was at the proper temperature. Nor was the allowable time for the withdrawal of the core so short as would be expected. In fact, it was necessary to wait a few seconds after pouring before removing the core.

If, then, an iron core could be easily withdrawn from a tube 1 ft. long, it was possible that it could be withdrawn from a tube 5 ft. long. This was attempted and repeatedly accomplished, a 4-in. pipe 5 ft. long being cast on an iron core, as in Fig. 1, and the core removed before being gripped by the contraction of the pipe. We found by these trials that no gases were formed other than those from the air in the mold, and if this air was allowed free vent no trouble was experienced in filling a mold of any shape or size, and in removing the resulting casting at such temperature as to avoid white chilled crystals.

The next step was to determine what size and shape of mold was best adapted to this process. This was a long and tedious investigation, most of the results obtained being of a negative character. It is almost impossible to formulate any set rule as to size and shape of mold for various castings. The one general rule of allowing a surplus of metal in every case seems the best practice. This is, of course, very indefinite, and experience only will show what is best. The mold used for casting traps, Fig. 2, weighs 1700 lb., and the 2-in. tee mold, Fig. 3, confesses to over 500 lb. The advantage of providing a large bulk of iron is too great to be ignored when it is considered that the objects desired are not only swiftly to remove the heat from the molten iron but also to provide enough metal to store this heat and resist the tremendous strains imposed.

It is to be observed that in using these molds we take no precautions against shrinkage. We depend altogether upon the fact that chilling molten iron swiftly to the point of setting makes castings that are homogeneous, and thus the shrinkage strains due to irregular cooling are reduced to a minimum. The main object to be accomplished is to secure rigidity of the mold in all its parts—there is always time enough to remove the casting and retain the shape given it by the firm, unyielding surface. A mold that has thin walls—1½ or 2 in. thick—will spring away from the molten iron under the influence of the intense heat, and the casting will invariably follow the spring. Molten iron like water moves in the line of least resistance. Its peculiar property of increasing in bulk when passing from the molten to the solid state makes it possible to get a casting that fills every crack and cranny of the mold so long as this tendency to swell is successfully resisted. This same mass of iron in the mold, by reason of its rigidity and its capacity for quickly transmitting and storing heat, will greatly lessen the liability to cracks in the mold cavity. The only place where any deterioration sets in is where the molten iron strikes in the gates, Fig. 4, and our experience has shown that we can safely neglect this item.

How long a cast iron mold will last has not yet been

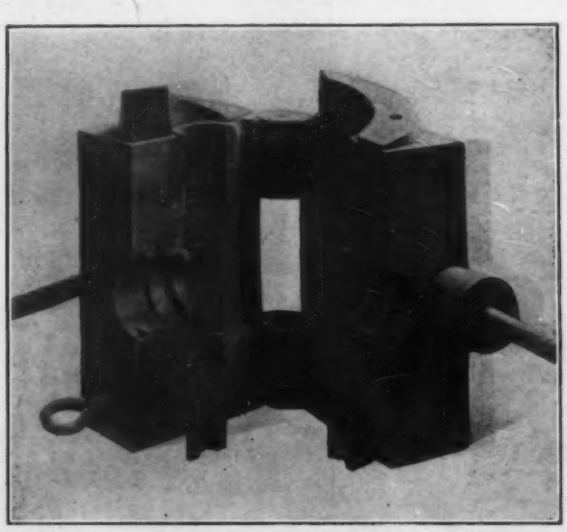


Fig. 3.—A 2-In. Tee Mold in Use Over Seven Months.

Fig. 4.—Cracks in a Gate.

determined. So far we have made over 6000 pieces in a single mold, and it is in better shape now than when we started. There is no reason why its life should not be indefinite, although there must be a point of time and service when the cast iron has reached its ultimate capacity for work. Our statistics show that the life of the mold depends, not upon the number of pourings but upon the number of times the mold is allowed to become entirely cold and then reheated. Continuous pouring, when correctly timed so as to preserve a generally even temperature, has but a very slight tendency to crack the mold. It is only when it is allowed to cool that the cracking becomes at all noticeable, and then only in the gates.

The Mold and the Core.

We have found that a good casting can be made in a cold mold without any trouble, provided the mold is perfectly dry. But the tendency of the iron to condense moisture from the atmosphere while heating up is so great as to make it almost impossible to get a good casting unless the pouring is done rapidly, so that the mold will be filled before the moisture is deposited upon the face of the mold. In a perfectly dry atmosphere, with a cold mold, the iron pours readily and makes a very fine casting. The only reason it is desirable to have the molds warm is that they will then keep perfectly dry. We would much prefer to do all our work with a mold at a temperature of not more than 125 to 150 degrees F. As a general rule, the first casting is not a very good one, but after the casting has warmed up the mold there is no further difficulty.

In order to preserve an even temperature in the mold it becomes necessary to put enough weight into it and pour the castings at such intervals that the temperature will not rise over a certain number of degrees. For instance, we found that casting a 4-in. pipe weighing 65 lb. into a mold weighing 6500 lb. every seven minutes does not raise the temperature of the mold to more than 300 degrees. This matter of heating depends altogether upon the thickness of the casting, and the molds must be designed with that particular point in mind.

That a permanent core can be used in a great many cases has been shown. The use of this permanent core is necessarily limited to castings in which the core is either in a straight line or is in a regular curve. Combinations of straight lines, such as in Ts or Ys, or double Ts or double Ys or straight pipes, are especially adapted to this feature. When the core is in the shape of a regular curve, or combination of a straight line and regular curve, it can be made in two or more pieces and easily withdrawn from the casting. This can be done in the case of Ls or sweeps. Irregular curves or cores that would be destroyed in removing them from the casting are, of course, not possible.

We have found that the best metal for these cores is ordinary cast iron, and that the same method of procedure must be carried out for the core as with the mold. There is plenty of time to remove the core and open the mold and yet have the casting without any hard spots. The use of permanent cores suggests the possibility of a machine for duplicate work that is to be made in large quantities, and this machine can be practically automatic in its operation. Pipe fittings, chain links and elevator buckets might possibly come under this class. This is, perhaps, looking rather far into the future, but it is the logical outcome of the successful carrying out of the principle involved.

Another point: It has been found easy to remove a 5-ft. core in the manufacture of cast iron soil pipe. It should be just as possible to remove a 12-ft. core from a water pipe. It is only a question of apparatus large and powerful enough, and removing at the proper speed. Cores made of steel and wrought iron have been tried but give very poor results. The cast iron cores require considerable attention for the first few pourings, to prevent burning and distortion, but after a few castings have been made the iron seems to become seasoned, and after 50 or 100 castings have been poured, very little care need be taken in regard to overheating the arbor or burning it by the impact of molten iron. An arbor

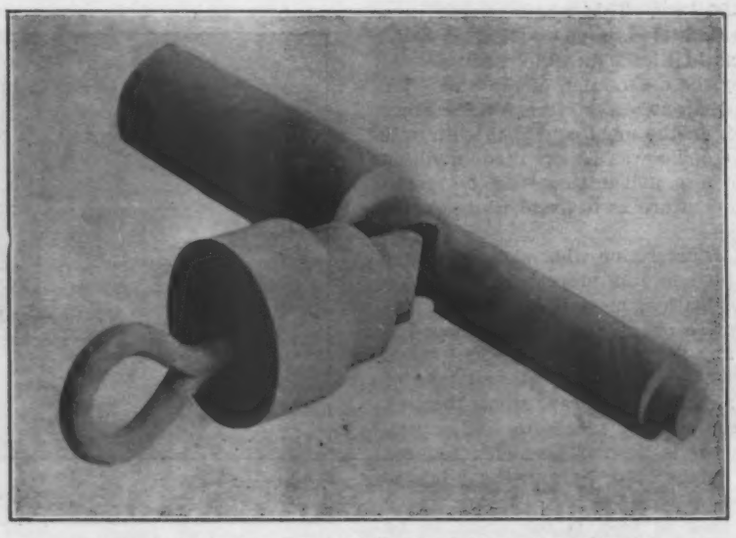


Fig. 5.—Arbor for 2-In. Tee, in Daily Use for Over Seven Months.

for a 2-in. tee, in good condition after seven months' use, is shown in Fig. 5.

Soft cast iron seems to be the best medium for both molds and cores. It cracks less, and is not liable to distort, as is the case with a casting made of low silicon or very close iron. It may be that this is due to the fact that a high silicon iron melts at a much higher temperature than iron containing a low percentage of silicon, and consequently requires a higher temperature to reach the point at which it softens.

The conclusions arrived at as the result of these investigations may be summarized as follows: Any casting that can be poured in a sand mold can be poured in an iron mold. If the iron is hot enough to run in a green sand mold it will surely run in an iron mold. Iron that is suitable for radiators or fittings, or brake shoes, or any other class of duplicate work that it made in the sand, will be suitable for the use of permanent molds. The same experience that shows the foundryman what is best for sand molding can be utilized in permanent mold work. It is true that a somewhat wider range of iron can be used in permanent molds for the same class of work than is the case in sand molding, but any change from the general practice in selecting irons for any particular class of work must be made with a great deal of care. It is, of course, a subject that demands close and incessant study, and every manufacturer who wishes to use permanent molds must give the same care and thought to this method that he gave to previous methods employed. When the high class engineering and technical skill is applied to the permanent mold that has been devoted to the molding machines now in use, we may expect to see some very wonderful developments in the foundry line.

The Temperature of the Iron.

There is one more feature, and that is the temperature of the molten iron. In all cases, when using permanent molds, the iron as it comes from the cupola should be very hot and should never be allowed to stand any length of time before pouring. The first element it loses in cooling is carbon, especially if there is considerable silicon in the original charge. Iron at 2100 degrees F., with 2.5 per cent. silicon, will not hold as much carbon in solution as it will at 2400 degrees F., and it is the carbon we wish to preserve. In fact, it is almost impossible to make a very thin casting in an iron mold, with iron containing 2.75 silicon and low in phosphorus and sulphur, unless the iron is very hot. Our work has shown us conclusively that the best results are obtained with iron containing over 3 per cent. carbon and about 2 per cent. silicon. Again, the higher the temperature of the initial iron, the more time there is for the removal of the casting and the longer shrinkage is delayed. The importance of hot iron is therefore evident, although there is but little loss of carbon when the silicon does not exceed 2.25 per cent. and ordinary diligence is used in pouring.

Fig. 7.—The Thread in This Casting Was Cut and Micrometered. The Casting Was Then Heated and Quenched in Cold Water Six Times, with a Distortion of but 0.002 In.

Some care must be exercised to prevent the casting sticking in the mold. It is sufficient to coat the mold occasionally with a mixture of thin oil and graphite. There is no virtue in any of the many coatings recommended other than keeping the molds smooth and preventing the castings from sticking. None will prevent chilling, unless laid on in such quantities as to form a substantial wall of inert material. The writer has used almost every available substance in an infinite number of mixtures, with but indifferent results. Mica, lithophone, clay, graphite, molasses, water and clay, paraffin with any number of materials, have been tried, but one and all require a coating at each cast, which is out of the question in rapid work. A thin solution of wood alcohol and shellac, thickened with finely ground clay, when applied to a slightly warm mold, will usually prevent chill, but here again the mold must be cleaned and recoated for each casting. Silicate of soda when fused to the mold has but a very short life, and amorphous phosphorus has an entirely undeserved reputation in the line of chill prevention. The best way to prevent a chill is to take the casting away from the mold before the chill sets in.

That this chilling does not take place until after the iron has been set sufficiently to handle is demonstrated by a small sample casting made especially for the purpose. One side of this casting is soft and the other is

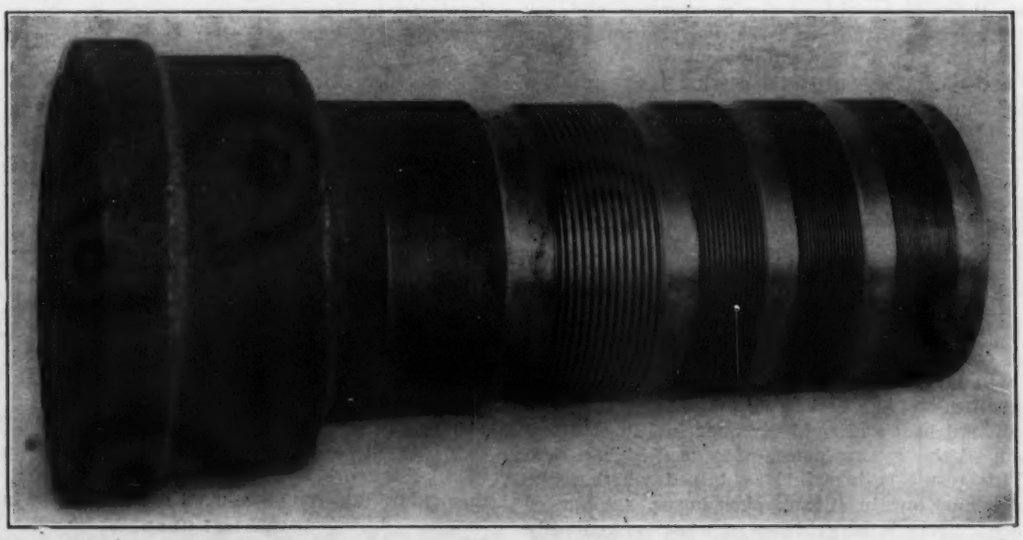


Fig. 6.—Section of Pipe on Which Threads Have Been Cut. This Pipe Was Not Annealed or Treated in Any Way. Number of Threads, 8 to 32 to the Inch.

chilled. The casting was broken to show the effect. The quality of the iron in the unchilled portion is of the highest character, and the facility with which it can be machined is shown by a section of pipe, as in Fig. 6, on which some threads have been cut. This sudden chilling to the point at which the molten iron sets produces an iron that is nearly homogenous as it is possible to obtain. That it is entirely free from shrinkage strains is shown by a casting that was taken from the mold at a bright red heat and thrown into cold water. It is absolutely sound and free from all cracks, surface or otherwise. Fig. 7 shows that as the result of heating and repeated quenching there is practically no distortion.

Now, what peculiar molecular action is set up that produces this result in an iron that when cast in sand exhibits all the defects we are accustomed to see in sand molding? To get at this explanation we must begin with the great unmeasurable force of heat contraction and expansion. No one knows how many tons per square inch is exerted when molten iron cools. This force is always greater than the tensile strength of the material under treatment. If, now, molten iron be subjected to this enormous force exerted through the mold, swiftly robbing it of its heat, it probably follows that the molecules are crushed together with an enormous pressure, and since this action is a matter of a few seconds at the most, there is no chance for segregation and the impurities remain in the same relative position in the casting that they occupied in the molten iron. That this peculiar action continues after the casting has been taken from the mold is shown by the small globules of iron that have been squeezed from the casting as it cooled, as in the tee shown in Fig. 8. It is further shown by the bar of 1⅛-in. iron that was taken from the mold at a bright yellow heat, with the interior still molten. The excrescences on the top were formed as the bar cooled in the atmosphere, and the broken section will show that the bar is of equal hardness throughout.

Now, let us go a step further. It has been found that iron when cast in an iron mold and removed as soon as it set possesses some unusual properties. For one thing it will take a temper, and when tempered will retain magnetism. If the casting be taken from the mold at a bright red heat and suddenly quenched in cold water, it has all the cutting power of a good high carbon steel. This result is invariably obtained whether the iron be high or low in silicon, phosphorus, sulphur or manganese. There is no evidence of what we generally speak of as "chill"—no white crystals are shown; in fact, an iron that chills white first in the mold and is then quenched in water will not harden in the manner described, but will crumble when applied to the emery wheel.

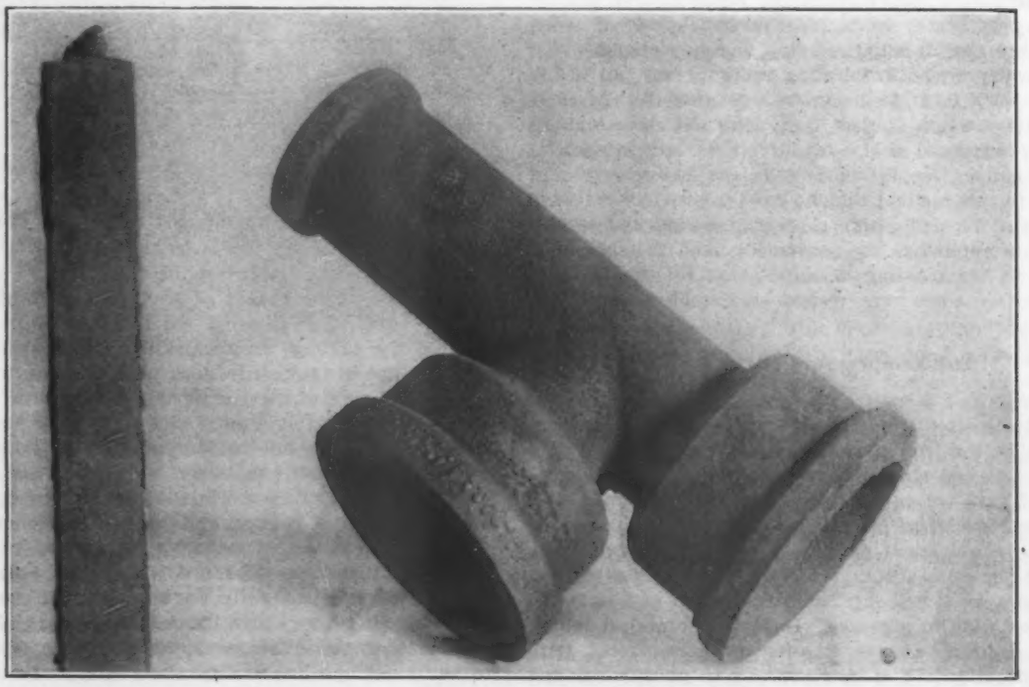


Fig. 8.—Effect When Castings Are Taken from the Mold with Interior Still Molten—Globules of Iron on the Surface of the Tee and Irregular Excrescence at Top of Bar.

Effect of Chilling Followed by Slow Cooling.

The fact of the matter is simply that chilling molten iron swiftly to the point of setting, and then allowing it to cool gradually, produces a metal that is entirely new to the art. It has all the chemical characteristics of cast iron, with the exception of combined carbon, and it also possesses some of the properties of high carbon steel. We have been taught that steel will not take a temper when it contains a very appreciable amount of free carbon, yet this piece of cast iron, that has 0.44 per cent. combined and over 2 per cent. free carbon, has been tempered repeatedly and will do better service in a lathe than a very good non-alloy steel. Once this peculiar property is imparted to the casting it is impossible to eliminate it except by remelting. A bar of iron so treated can be held in a flame until the metal drips from the end, and yet quenching will restore it to its original hardness. The analysis of the piece of treated iron before us is as follows:

	Per cent.
Silicon	2.28
Phosphorus	1.21
Sulphur	0.108
Manganese	0.41
Total carbon	2.65
Combined carbon	0.44

An analysis of another piece shows:

Silicon	2.24
Phosphorus	1.12
Sulphur	1.01
Manganese	0.38
Total carbon	3.02
Combined carbon	1.54

It will be noticed that the carbon for the first piece is low, much lower than we like to have it for our general work. But the remarkable feature about this particular phase of the process is that such a close grained, tough and strong iron should be produced with an analysis such as given above. The analysis of this iron, taken after it is removed from the mold, and without quenching, is the same as above, except that the combined carbon is not over 0.28 per cent.

The character of the iron before being quenched is very fine, close grained, and yet it is easily machined. In all this work there are no blow holes, and any dirt that enters into the piece must come from the ladle.

Chemical Changes.

In some of our earlier writings on casting in permanent molds the effect of the carbon in cast iron was ex-

haustively treated. In order to make clear the chemical changes that occur in this process, it may be well to repeat some of the conclusions:

All the carbon in molten iron is in solution, and exists in the combined form. Now, if molten iron be instantly cooled to 1000 degrees F. all the carbon will be held in the combined form—there will be no free carbon. If, however, it be instantly cooled to the point at which the iron sets, and then allowed to cool normally, the carbon will be in the combined form at the time of setting, but will change to the free form as the cooling progresses. This formation of free carbon is very rapid. The major portion present in the casting is formed within a few seconds after it is taken from the mold. The analyses below give a very fair idea of this action, the pieces in question being 6 x 1¼ x ½ in.:

	Combined carbon.	Total carbon.
Cast in sand and cooled normally	0.27	3.20
Taken from permanent mold at bright yellow and quenched	1.50	3.02
Taken from permanent mold at bright red and quenched	0.49	3.10

It will be seen from this that two-thirds of the combined carbon has been changed in the few seconds required to cool from a bright yellow to the bright red. The free carbon in all these castings is not in the form of graphite carbon, as we usually see it in ordinary cast iron, but partakes more of the character of annealing carbon. It is probably this annealing carbon that gives permanent mold castings their unusual strength and toughness.

The difficulties that confront an investigator who attempts to look into the manufacture of castings are so great, owing to the peculiar conditions that surround the art, that much of the information that has heretofore been given is of value only when the local conditions are fully known. Our present day technical journals, with their earnest and persistent work, have gone far toward making the foundryman's art a scientific process; but, after all, the sum total of all these efforts has been to seek a remedy for the difficulties encountered, in a process that in itself must of necessity often give unsatisfactory results. Sand as a medium for making general castings will always hold its own. We have discovered nothing that is so cheap and so efficient, considering the vast range of work it is required to do. Its deficiencies are well known; but so far all efforts to overcome these deficiencies have been solely in the direction of shedding light upon the characteristics of the iron used.

Segregation Makes Sulphur and Phosphorus Harmful.

We read a great deal about the evils of sulphur and of phosphorus, and we find that these evils are not exaggerated when it comes to making castings in sand. But to my mind, the reason why phosphorus and sulphur are the bane of the foundryman's existence is not because of the mere fact that sulphur and phosphorus are present in the casting, but because in slow cooling in sand molds sulphur and phosphorus segregate. Therefore, the great evil in casting work is not so much the presence of impurities, but the fact that segregation allows these impurities to mass themselves and thus destroy the homogeneity of the iron.

Our experiments have shown that an iron containing 1½ per cent. phosphorus when cast in an iron mold is as strong as iron containing 0.4 per cent. when cast in a sand mold. We can find no perceptible difference in the tensile strength under these circumstances. The same is true with sulphur at 0.1 and sulphur at 0.03, and it would seem, therefore, that the mere fact of the presence of sulphur and phosphorus in these irons is not deleterious when segregation is prevented.

It is not within the province of the sand mold to prevent segregation; nor is it possible to prevent a certain amount of segregation in a permanent mold when the casting is so thick in section as to make the cooling comparatively slow. Fortunately, most of the duplicate work in this country to which the permanent mold is applicable is comparatively small section. Very little of it is more than 1 in. or 1½ in. in the thickest part, and when a casting is not thicker than the figures given above and is made in a mold properly designed there will be absolutely no segregation.

The formation and segregation of graphite carbon is familiar to all, and its weakening effect upon cast iron is very well known. The casting made as above described, and containing free carbon that is thoroughly distributed throughout every portion of the iron and is not allowed to collect in large flakes or bunches, will have greater tensile and crushing strength than a casting made in a sand mold in the ordinary way, and will be as easily machined.

The position the writer takes in this matter is that the evils of phosphorus and sulphur are due, not to the fact that these elements are present in the casting, but to the fact that the slow cooling allows them to collect in masses. If segregation were prevented a high phosphorus or a comparatively high sulphur casting would be just as strong as if these elements were low in percentage.

Direct Metals and Permanent Molds.

So far we have discussed simply the use of the permanent mold as applied to the foundryman's art, with iron taken from the cupola. If, then, permanent molds can be used with success in the foundry, and a system of continuous pouring be inaugurated, which in duplicate work would obviate the necessity of having molders, why is it necessary to melt pig iron in the cupola? What could be more ideal than a series of permanent molds supplied with molten iron practically direct from the blast furnace? The interposition of a reheating ladle such as is used by the steel makers of to-day, presents no unusual features; and this ladle makes possible the treatment of the molten iron. Modern practice has eliminated much of the uncertainty in blast furnace work, and it is not unusual to find these furnaces so equipped as to produce an iron that varies but few points from the quality desired by the foundryman. The molten iron we get from the blast furnace is much hotter than that obtained from the cupola, so that there is every reason to believe that the castings we would obtain would be of a better quality than when the pig is remelted in the cupola.

In our work we have conclusively demonstrated that it is immaterial whether an iron contains 1.75 or 3 per cent. silicon, so long as the molten mass is at the proper temperature, so that the high temperatures obtained from the blast furnace would go far toward offsetting the variations in the impurities. Given, therefore, a furnace properly equipped and properly handled, with the interposition of a reheating ladle, there is no reason why a very high class of work should not be obtained with the use of permanent molds. How far this thought can be carried out lies with the blast furnace owner.

Pennsylvania Railroad Accidents in 1908.—Reports just compiled of all accidents on the 23,000 miles of track of the Pennsylvania Railroad system for the past year show that during 1908 its various lines carried 141,659,543 passengers, and that not one single passenger was killed as the result of an accident to a train. The total number of passengers injured in train accidents numbered only 102. These figures include every case requiring surgical or medical attention, however trivial. It will thus appear that, counting every personal injury due to train wrecks, only one person out of every 1,388,819 passengers carried was injured. Of the subsidiary lines, independently operated, the record of the Long Island Railroad is most striking. That line carried during the year 23,242,838 passengers, and only 17 were injured in train accidents. This line has now been operated for some 15 years without a fatality to a passenger, due to a train wreck.

The Phillips Sheet & Tin Plate Company, operating a tin plate mill at Clarksburg, W. Va., will establish a new town to be known as Weir, named after E. T. Weir, president of the company, near Holliday's Cove, W. Va., on the Ohio River, about four miles above Steubenville, where the company is now erecting another tin plate mill.

The Pittsburgh Supply and Machinery Conventions.

The Annual Meetings of The American Supply and Machinery Manufacturers' Association and The National Supply and Machinery Dealers' Association, held May 12, 13 and 14. Better Quality of Products and Higher Standard of Dealing the Keynotes of Deliberations.

Some one ventured the remark that for a long time previous Pittsburgh had not been as smoky as it was during the latter part of last week. In explanation, some thought the condition due to a genuine improvement of business, which even the most conservative Pittsburghers earnestly say they are experiencing now. Others seemed to think it was issuing from the Fort Pitt Hotel, where several hundred of America's prominent makers and sellers of machinery and supplies had gathered for a three days' council. If that solution was correct it was the smoke of the pipe of peace, for a more harmonious gathering of business rivals could not be imagined. Certain it is that the smoke was not the kind of blue haze which but a few years ago might have been expected to fill the atmosphere if such a thing as an assemblage of the sort were possible at the bottom of a long drawn out period of business depression.

The reason for the very happy state of mind which characterized the proceedings is not hard to find when these proceedings are analyzed. It is simply this: Both manufacturer and dealer spent most of their time in talking "quality of product"; in discussing the subject of elevating the standard of production and making it possible for the consumer to actually obtain quality goods when he has been educated to a point of asking for them. The undercurrent of thought throughout the meetings was that underneath all price cutting and unfair competition lies poorly made goods, and that to elevate the methods of marketing goods it is essential that the quality of the goods themselves be raised to and maintained at the highest standard. Therefore, high grade products sold at the resale price basis is the remedy suggested by the manufacturers and dealers for the most pronounced evils of the supply and machinery trade. In this connection serious consideration was given the feasibility of adopting means of stamping or in some way identifying articles which fully come up to determined specifications or standards of quality, so that they may be distinguished by the consumer.

It was generally acknowledged on all sides that this movement is one of the most important that has been broached in these trades in the present campaign for the general betterment of the supply and machinery trade. Great credit is due Charles F. Aaron, who, as president of the Manufacturers' Association, brought this subject to its present position of importance.

The sessions were all well attended, and the rank and file of members of both associations displayed a keen interest in discussing the problems before their organizations. Separate executive sessions of both associations were held simultaneously and joint meetings of both manufacturers and dealers were held for disposition of matters relating to both bodies and in which an immediate interchange of ideas was desirable.

Summary of What Was Done.

Fixing Definite Standards of Excellence.—After considerable discussion of the subject of fixing certain standards of quality, the following resolution was adopted at a joint meeting of the manufacturers and the dealers:

Resolved, That it is the sense of this, the joint meeting of the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, that the standardization of certain lines is not only possible but imperative for the general welfare of not only the manufacturer and dealer, but also the consuming public.

We, therefore, petition the chair to appoint a committee whose membership shall be equally composed of both manufacturers and dealers, whose duties shall be to further investigate this subject.

In view of the importance of the subject it was deemed wise to withhold the appointment of the committee until the matter might be more thoroughly investigated and the most desirable selection possible be made.

The discussion which prompted this resolution evinced the opinion that it would be perfectly feasible in certain lines of product to arrive at certain specifications which would set the standard for first quality goods in these lines. A manufacturer following these specifications, it was argued, could then affix to them a stamp, label or some designation issued by the manufacturers' association, which would not only serve as a guarantee of quality to the dealer, but would be a distinguishing mark of merit for the consumer as well. The work which is now being followed out along these lines by the National Committee of the Confederated Supply Associations in the plumbing supply field was cited as a precedent. In this instance the trade name "Naco" has been selected as the distinctive mark branding goods as of first quality, and it is intended that the word shall be legally protected against indiscriminate use. In order to prevent any use of the word in connection with the poorer grades of material, it is quite probable that the National Committee will, through the aid of the members of the associations it represents, establish standards of quality, and then issue a license to use the word only to those whose goods conform to the standard set. The license fees are to be used in acquainting the consumers with the significance of the word "Naco," and urging their purchase of goods bearing the mark.

The Manufacturers' Declaration of Principles.—It will be recalled that some time ago the Executive Committee of the Manufacturers' Association issued their now famous declaration of principles, outlining a policy so lofty in its ideals that it has everywhere met with distinct approval. At the Chattanooga convention of the Southern Supply and Machinery Dealers' Association it was heartily indorsed. At Pittsburgh the members of the Manufacturers' Association officially indorsed their Executive Committee's action in promulgating the document and unanimously commended them for their brilliant achievement. The National Supply and Machinery Dealers' Association concurred with the Southern Dealers in their action and joined them in stating that they would give preference at all times in their purchases to the manufacturers who are members of the American Supply and Machinery Manufacturers' Association. The resolution is as follows:

We indorse the declaration of principles adopted by the American Supply and Machinery Manufacturers' Association and will do everything in our power to further, by the support of all our members, those principles and give our preference at all times in our purchases to the manufacturers who are members of the American Supply and Machinery Manufacturers' Association.

The National Dealers' Declaration of Principles.—Following as closely as possible the document of the manufacturers, the National Dealers' Association, to show their complete approval, adopted the following as their own declaration of principles:

UNFAIR COMPETITION.

We are opposed to unfair competition. This strikes at the wage earner, often compelling reduction in costs of production at the expense of labor. It menaces the dealer by depriving him of the legitimate profits to which he is entitled. It increases expenses of operation and production to the consumer by forcing down the qualities of goods marketed. Its effect on manufacture is to compel changing basis of qualities to meet price conditions, sacrificing reputations to demands thus unjustly created.

We therefore favor such changes in the bankruptcy laws or other legislation as will tend to discourage and prevent disastrous competition caused by the inexperienced or unprincipled manufacturer or dealer who fails to provide for his actual manufacturing costs, the actual expense of doing business, or to allow for a reasonable margin of profits in making his prices, thereby bringing ultimate failure upon himself, hardship upon

his employees and loss upon other manufacturers and dealers in his line and the public in general.

These and other classes of unfair competition are the stepping-stones to fraud, fire and failures.

ENCOURAGEMENT OF HIGH QUALITIES IN ARTICLES MANUFACTURED.

We are unalterably opposed to the substitution of inferior goods as first qualities, either by manufacturer or dealer.

We oppose the practice of the manufacturer of inferior goods under private brands that can be marketed to the prejudice of other makers' first quality goods.

We indorse the policy of promotion by the manufacturers of the value of trademarks, brands and other recognized means of securing identification of all their products, thus affording protection alike to the user, the distributer and the manufacturer.

RESALE PRICES.

Resolved, That the members of this association shall encourage sales to the consumer on the basis of proper resale prices, insisting upon such prices where goods are sold by makers or their representatives direct, and offering every encouragement to the manufacturer for co-operative action in carrying out this policy.

We unite to discourage the obtaining of unfair profits by selling certain classes of goods at prices carrying more than reasonable profits in order that other classes may be sold at prices that carry no profit, thus preventing honest and healthy competition.

The proper resale price can only be established by the most careful consideration of each line of goods, and arrived at by joint conferences on the part of the makers of such goods and the dealers therein. We favor the selection of committees drawn from the representative manufacturers and dealers who can arrive at such fair conclusions as will establish proper resale prices that will enable the consumer to secure goods of the best qualities and under the fairest conditions.

Consideration of Grievances.—The following resolution, which we learn was concurred in by the Southern Supply and Machinery Dealers' Association at an executive session just before the close of its Chattanooga convention, was also concurred in by the National Supply and Machinery Dealers' Association:

Resolved, That any complaints made against any member of our association, whether on prices or other trade matters, shall be made by the secretary of the Supply and Machinery Dealers' Association to our Grievance Committee, and on investigation by such committee, with the aid of the member complained of, a report of such committee be submitted to the Executive Committee of the Southern Supply and Machinery Dealers' Association and passed upon by them before placing before the lay members of the Southern Supply and Machinery Dealers' Association.

The object of this measure is to give the manufacturer a hearing before information which might injure him in the eyes of the dealers generally should be spread broadcast among the dealers.

Resale Prices.—The dealers concluded their discussion of this subject by reaffirming their resolution adopted in Cincinnati at the 1907 convention. This resolution pledged the encouragement of the dealers to the manufacturers establishing resale prices on their goods.

The manufacturers decided to appoint a committee to confer with the dealers' associations and the makers of sandpaper, with a view of placing the latter product on a resale basis.

A resolution adopted by the manufacturers makes it possible for the manufacturers to make special arrangements with dealers who take a special interest in pushing and carrying lines bearing a resale price. It also placed the burden of maintenance of resale prices more definitely upon the dealer. The resolution is as follows:

Resolved, That after a thorough discussion by the members of the Executive Committee of the American Supply and Machinery Manufacturers' Association, during which the matter of resale prices was taken up, it was the opinion of the committee that they could only go so far in the matter of maintenance of ultimate resale prices as to discriminate according to their own judgment among different classes of purchasers of their products; further, be it

Resolved, That this committee recommends to members of the association that they regulate their prices by classes, so as to give preference to those of their customers who handle their goods as a specialty, carry them in stock and act in a general way as their direct agents; and as to such members selling an exclusive agency in each city or district, that such manufacturers suggest the prices at which such goods are to be sold to the users; it being the sense of this association that the burden of maintaining such proper distributing prices to the using trade shall be borne by the distributing agent.

Machine Tools.—At a session of the dealers' association devoted exclusively to the discussion of this branch of the trade and over which Henry Prentiss of the Prentiss Tool & Supply Company presided, the most important theme was the increase of commissions to the dealer on certain lines. It was argued that in view of the higher cost of selling machine tools, the commissions should not be lower than 12½ per cent. The subject was gone into very thoroughly and considerable data were presented by dealers showing that the average cost of selling tools made it unprofitable to handle them at less than 12½ per cent. It was the sentiment of the dealers, individually, that in view of this fact they would confine their efforts to pushing such lines as paid this adequate commission.

The matter of territorial rights of dealers, among themselves, was gone into at length, and it was decided to relieve the manufacturers of the burden of deciding controversies arising among dealers by finally fixing it that the manufacturers should pay the commission to the dealer in whose territory the machine is ultimately installed. If through any special connections it should develop that a dealer may have a better chance of selling a certain tool in another dealers' territory than the dealer in whose district the consumer is located, the matter will have to be settled between the two dealers, the manufacturer paying the commission to the dealer in the territory, who in turn will make his arrangement with the outside dealer making the sale. The negotiations between the two dealers will have to be made prior to the transaction, however, or the dealer who goes into another's territory risks losing his commission entirely.

The members present decided to write letters to those machine tool builders who have maintained their prices throughout the recent depression, thanking them for their firm stand, especially in view of the fact that a reduction would have caused a considerable loss to the dealers who were carrying considerable stocks when business fell off.

Railroad Legislation.—The following resolution was adopted by the manufacturers' association:

Whereas, The period of general industrial depression which has prevailed throughout the country the past 18 months, while, in our opinion, brought on by reckless speculation, over-expansion and undue absorption of capital by large business interests, without proper consideration of the general welfare, which we believe to be now universally acknowledged and deprecated, yet nevertheless we believe that this depression has been and is now in danger of being continued beyond its logical or necessary limit by reason, to a considerable extent, of the acts of the National and State legislatures looking to the regulation of the largest business interest of the country—viz., the railroads; and

Whereas, We believe that while the greater portion of such legislation was necessary and will ultimately prove beneficial, yet a further continuance of unnecessary legislation antagonistic to these interests will be prejudicial to the general welfare of our country, tending as it must to restrict that proper development of our railroad system which is absolutely essential to the successful growth of all manufacturing, agricultural and other industrial enterprises; now therefore be it

Resolved, That the American Supply and Machinery Manufacturers' Association earnestly recommends the cessation of further legislation by either State or National bodies, adversely affecting railroad interests, except such as, after careful consideration, may be found imperative for the protection of the public interest: and be it further

Resolved, That it is the opinion of this association in convention assembled that if the administrative organizations and officials of the railroads themselves will show their confidence in the sound commonsense of the American people by going steadily and confidently ahead with that development and equipment of their properties which is clearly and unmistakably warranted, and will show to their patrons—the general public—that courteous and considerate attention which every other business organization must extend, in order to secure and hold the good-will and support of its patrons, they will do more to prevent further hostile legislation and promote industrial peace and commercial prosperity than can be accomplished by any other means, or any possible act of legislature or convention.

Parcels Post and One-Cent Postage.—This resolution was adopted by the Dealers' Association:

Whereas, Owing to the inequality of rates of postage on the various classes of mail matter and the rapid increase and extension of certain branches of postal service now conducted at a loss to the people of many millions of dollars annually; and

Whereas, Believing it unwise for the Government to invade the domain of private business enterprise by engaging in the business of transporting merchandise for a portion or all the people; therefore be it

Resolved, That we urge the members of this association to use their influence to prevent the passage of pending legislation for the establishment of a so-called parcel post.

Resolved further, That inasmuch as the Government is charging the letter writers of the country a rate of postage approximately three times greater than the cost of carrying letters,

that we urge on behalf of fairness and justice to all users of mail service the adoption of a 1-cent letter rate.

THE ADDRESSES.

Address to the Dealers.

BY THEIR PRESIDENT, GEORGE PUCHTA, QUEEN CITY SUPPLY COMPANY, CINCINNATI, OHIO.

During the past year business conditions have been unsatisfactory, but the spirit of co-operation and association work have shown that they are factors in many cases, by preventing radical reductions, losses in credits, helping reduction of stocks, &c., which individually would be impossible. The panic is over, prices are low, the tariff laws will soon be adjusted, crops evidently will be bountiful, and a national election has placed in the Presidential chair a fellow townsman, William H. Taft, in whom the country has confidence. With such favorable conditions business cannot stand still very long, and more prosperous days will naturally be in evidence soon.

We have practically retained our membership and made some additions. For the times experienced, this is very gratifying and good evidence of the value placed on our membership by our members.

ASSOCIATION BENEFITS.

Any one having doubts as to the good work and benefits rendered by our association to its members and our business in general should read over the proceedings of our meetings from our beginning, 1905, to date. Such a vast fund of information, many valuable suggestions, exchange of ideas, &c., and the good results, must be apparent to all. But it does not end here. The acquaintances and friendships formed at these meetings have given us pleasures and benefits hardly to be secured in any other way; in many instances replacing unfriendly and unprofitable competition with friendly and profitable rivalry.

Manufacturers whose products we sell are constantly increasing their co-operation with us, calling us in conference to assist in improving conditions and establishing better selling policies; thus accomplishing needful and beneficial results by means of association work, which as individuals we could not master. Much has already come from these relations, namely: establishing resale prices where prices were demoralized; eliminating competition of manufacturers in certain lines; securing larger differentials and preventing needless reductions in prices. Let us not be unmindful of the manufacturers who have shown this spirit. Unfortunately the manufacturers also have their troubles, but we find they are solving them by means of associations, and will do more for us as they become better organized. Likewise we can and are solving many of our troubles by means of associations, which we would find impossible otherwise. We are in an age of co-operation and must do our share along these lines if we would keep our place in the business world.

CO-OPERATION WITH MANUFACTURERS.

During the past year our machinery dealing members, by conferences with machine tool builders, have been able to avoid large reductions in prices of their goods, thereby preventing loss.

Resale prices have been quite well maintained, but every time a violation occurs, and there have been some, the manufacturer in some manner uses the occasion to prove that if the dealer does not keep the differential already offered it is sufficient evidence that he does not want more, and why protect him further? The most effective plan of resale is the resale price on the rebate plan, which eliminates price cutting. Additional lines, such as Packer ratchets, Coe wrenches and other articles have been placed on this plan, but there are still more lines that should be placed on the rebate plan.

I again wish to urge more co-operation locally, in cities and in neutral competitive districts, knowing that such co-operation is the means of better understandings, and it pays.

Negotiations and conferences were again conducted with manufacturers and manufacturers' associations in the lines of machine tools, bolts, nuts, chucks, set and cap screws, taps and dies, drills, ratchets, pipe and fittings, leather belting, sandpaper, wood pulleys, wrenches and files, and with some excellent results.

Several cases of unfair competition between manufacturers and jobbers and between jobbers in competing territories have been presented for adjustment, and in every case settled with entire satisfaction to all concerned.

We have continued our efforts for amending the Sherman anti-trust law and the discouragement of a parcels post and catalogue houses.

The Southern Supply & Machinery Dealers' Association has at all times been most friendly to us and assisted us in every possible way. Its members are engaged in the same work in the Southern territory that we are here. They were invited to meet with us, and the only reason they declined was because it is a matter of convenience and expediency for them to meet nearer to home, this time in Chattanooga.

In conclusion, let me say for this association, in the few years of its existence we may well be proud of its accomplishments. Being established on a firm foundation of right and justice, it will continue to grow in usefulness, and has become necessary for our business welfare. To you individually it means benefit and help from every point of view, and the more you use it and help it the more it will do for you.

Address to the Manufacturers.

BY THEIR PRESIDENT, CHARLES F. AARON, NEW YORK LEATHER BELTING COMPANY, NEW YORK.

The position which our association is in is briefly this: We, as manufacturers, were organized for the purpose of giving the dealers some responsible body with which they could co-operate in bringing about certain betterments in the trade relations between manufacturers and dealers. The duty of an individual manufacturer to a dealer or class of dealers is sometimes very difficult to control. That manufacturer when he is alone may hesitate about taking a stand that is perfectly legitimate which a dealers' body might ask him to take, but which might be wrong and yet because he was alone he would feel it necessary to take such a stand. On the other hand, there are manufacturers who are out of an association who might take a stand which would be inimical to the interests of dealers, yet in the association, realizing they would be hurting the interests of their fellow members, it might cause them to hesitate about taking such steps; so the logic of an association of manufacturers or an association of dealers is clearly in the right direction, and they afford mutual protection each to the other.

THE USEFULNESS OF THE ORGANIZATION.

I think the usefulness of our organization can be briefly summed up in this: Assistance on the part of one member of this organization toward all the other members in promoting a feeling on the part both of the user and dealer that the manufacturers associated in the American Supply and Machinery Manufacturers' Association are standing for an advanced principle in business ethics; that they mean what they say when they say they are against unfair competition; that their stand is in favor of quality maintenance and that they are in favor of the establishment of a proper and wholesome resale price policy.

This resale price policy seems to be an elusive thing. Nobody seems to know just how to take it, but, in the end, the essence of resale price can be found in maintenance of qualities. Standards that are fixed, standards that are indorsed, leave no room for the cutting of prices, but mean an effort on the part of both manufacturers and dealers who are willing to co-operate with manufacturers of that class in bringing an educational campaign to bear upon the people that will result in a higher quality and better quality of goods than ever before.

The manufacturers who are members of this association have received during the last year a great deal of benefit, I think, in their association with dealers, and perhaps far more so than they are able to appreciate at this time.

AN HONOR LIST OF MANUFACTURERS.

There is no question that to-day in all sections of our country we are all suffering from conditions of competition and conditions of business ethics. As applied to the individual control of business, that accounts in a very large way for the unfair competition to which we are all subjected. If you will stop to think what it means when a user of goods goes in the market to buy an article and he sends to a list that he may get out of some directory of manufacturers his specifications, he puts thereby everybody there in a class that is equal to the other man.

One manufacturer may make a class of goods that are in every way different from the other manufacturer. They may represent the two extremes in qualities, yet they are both put in the same class. They may represent the two extremes in the methods of conducting business, yet they are both put in the same class. How is that user, in face of the evidence that he has that these manufacturers are all manufacturers, to discriminate and know which of those manufacturers or which number of those manufacturers are in position to give him what he is looking for? And what he is looking for at all times is something that brings him an actual return for his money, sold to him on a fair basis of representation, maintaining the reputation of the manufacturer or the dealer through whom they are sold.

These dealers have allowed us to establish an honor list of manufacturers in the supply line. That honor list should stand with all dealers as an evidence of protection on the part of each one of the manufacturers in this association to every dealer, because past the dealer is the user, the man that we are all aiming to sell our goods to. He is the man that we want to have know that when he buys the goods made by any members of this association he can trust implicitly that when he specifies them through any dealer he will get absolutely fair treatment. We want to bring it down to a joint where the manufacturers of the better class of goods can afford to join this association and can hardly afford to be out of it, because if they are making that class of goods they belong with us. They may make just as good a class of goods and be outside, but there is no reason why

they should not place themselves on the same plane as ourselves.

A STANDARD OF QUALITY IN PLUMBING SUPPLIES.

As an evidence of what is being done in other lines to bring about a condition of fair competition, let me cite the plumbing supply line, where they have just patented or copyrighted the trade name Naco, which is to stand as a guarantee of quality in products of this line. It is to be issued, or rather the use of it is to be granted by license by the National Committee of the Confederated Supply Associations to manufacturers who comply with the specifications meriting it. In competition they found manufacturers, for instance, who were making a bath tub which was called an A1. That was a flawless bath tub, something that was absolutely perfect, yet it came in competition with bath tubs of various descriptions that did not begin to realize the value of the other, but which were sold sometimes by unscrupulous manufacturers or dealers as the equal of the A1. These men got to realize that not only was that an unfair condition to manufacturers, but to the dealers, because the dealer had to sell his product which he had bought on the basis of its best qualities against the mere representation and not delivery of facts when he came in competition with something inferior, and so they have found it necessary to issue qualification standards, and there is an A and a B and a C standard of value. A really A1 tub will be entitled to bear the guarantee mark Naco, and this will be the consumers' protection.

That is only in line with what it has been found necessary to do in other countries. In England, in the brass bedstead line, the workmen have begun to take the stand that when prices are cut it menaces their welfare; that if a bedstead manufacturer sells his goods to a dealer and that dealer breaks the price on those goods and the bedstead manufacturer does not take his product away from that dealer, they will not work for that manufacturer, because they realize that it means in the long run that the factories which make the best products, whose reputations are established, where the credit of the work goes to the workmen, are protecting themselves when they insist on such standards.

We have, perhaps, taken an advanced step as applied to the supply line, but we have not begun to do things that have been done in older countries hundreds and thousands of years ago. In China they have been doing that nearly 1000 years in certain gilds, and there you find competition on a fair basis. There, I grant you, you find denominational values of money so low that you can live for about a cent a day, but I believe their breathing apparatus is equally as good as ours and their health and general happiness, according to their standards, are as great as our own.

CARING FOR THE INTERESTS OF USERS.

During the past year that I have had the pleasure to preside as your president, I have had one view in mind, and that was this: To impress upon the dealers of this country that every officer and every member in this association was absolutely worthy of credence, and I have felt that it was my business to see that no individual act of my own would throw discredit upon the association in its relation to dealers.

In my speech at Cincinnati I called attention to a fact that had not been brought to association discussions, and that was this: Why, as dealers and as manufacturers, for a number of years we had met and discussed the question of how much profit a dealer should make on goods and how much differential a manufacturer should leave on goods, and we have never taken up and discussed the side of the question of what is due the users of goods in this country. It is due to them that the manufacturers of this association have made a selection of dealers and that we can indorse those dealers, and they can indorse us, and if every manufacturer of this association through his salesmen and directly when he comes in touch with the user of goods in any market says to him, "You may buy from any manufacturer in our association with positive security and you can buy from any dealer that a member of this organization elects to do business with," we will have done something then to place our organization in its ability to help others who are members of this organization, as well as dealers, a step further in advance of anything we have done before.

The Necessity of Clearly Defined Policies Among Manufacturers and Dealers.

BY F. A. HALL, MANAGER HOIST DEPARTMENT, YALE & TOWNE MANUFACTURING COMPANY, NEW YORK CITY.

A clearly defined policy, well thought out, and based on the actual conditions pertaining to the business in hand, is a very important factor in the success of any business. The time was when a business enterprise could be launched like a raft and carried by a favorable current to success; but in these days success requires the building of powerful business engines, which must be designed to serve a definite policy; upon the soundness and clearness of the policy depends the success or failure of the business. Without a definite policy, wisely devised and firmly carried out, it is easy for the strongest business to slip down, little by little, until the recovery of lost ground is almost impossible.

No single individual has the knowledge and experience to define ready made policies to suit the requirements of the varied interests represented here. Many matters of business policy must be worked out individually to suit particular cases, and even these can be worked out to better advantage in the light of the interchange of opinion at these conventions, if these conventions are made what they ought to be.

We have in this country to-day a Department of Commerce and Labor, which is maintained by the government for the express purpose of benefiting business, and thereby benefiting every citizen and every individual in the country. This department has already done great work in certain lines by compelling the reform of abuses, and in the case of food and drugs has secured the co-operation of at least one important trade association in making the law effectively support the maintenance of higher standards with ultimate benefit to all. This department is seeking, as all the delegates to this convention in attendance on this meeting, the establishment of standards in product and in business for the benefit and protection of producer, distributor and consumer. This department cannot immediately come to us to learn our needs, but must give its first consideration to those needs which are effectively brought to its attention.

In an inspiring address before the Passaic Board of Trade, which I recently enjoyed hearing, the secretary of this department, Mr. Nagle, gave emphasis to the necessity for the establishment of standards. Our President, Mr. Taft, whom we are still expecting to see in Passaic, has gathered together a mighty cabinet of corporation lawyers who know the ropes for the establishment of standards in business.

We would like to have these men come to our gatherings and address us, but we like also to know that they are determined to attend to our business for which we sent them to Washington. But if they are to attend to this business for us, we must give them our support. We have information which they need, and we must find means of transmitting it to them. They have gathered information which we need, and we must find means of obtaining from them the benefits which they are there to obtain for us.

The first necessity for the definition of policies is clear knowledge of the facts. I, therefore, hope that some action may be taken at this convention, through its officers, or through a joint committee, to confer with the Secretary of Commerce and Labor regarding the establishment of standards of product and standards of business, and that the Southern Supply and Machinery Dealers' Association be invited to unite with us in such action.

Interesting addresses were also made on the value of association work by D. K. Swartwout, Ohio Blower Company, Cleveland, Ohio, and W. E. Frick, Frick & Lindsay Company, Pittsburgh, Pa.

Election of Officers.

The Manufacturers' Association:

President, John Trix, American Injector Company, Detroit, Mich.; first vice-president, Henry B. Lupton, Oliver Iron & Steel Company, Pittsburgh, Pa.; second vice-president, J. W. Gardner, Gardner Governor Company, Quincy, Ill.; third vice-president, D. K. Swartwout, Ohio Blower Company, Cleveland, Ohio; Executive Committee—S. P. Browning, Ohio Valley Pulley Works, Inc., Maysville, Ky.; E. Bertram Pike, Pike Mfg. Company, Pike, N. H.; C. A. Hubbel, T. R. Almond Mfg. Company, Ashburnham, Mass.; Dougall Roberts, Roberts Brass Mfg. Company, Detroit, Mich.

Advisory Board, Conference and Grievance Committee.—Edward C. Hinman, American Steam Pump Company, Battle Creek, Mich.; Samuel L. Moyer, Lunkenheimer Company, Cincinnati, Ohio; Melville W. Mix, Dodge Mfg. Company, Mishawaka, Ind.; N. A. Gladding, E. C. Atkins & Co., Inc., Indianapolis, Ind.; Charles F. Aaron, New York Leather Belting Company, New York.

The Dealers' Association:

President, W. M. Pattison, The W. M. Pattison Supply Company, Cleveland, Ohio; first vice-president, W. L. Rodgers, Pittsburgh Gage & Supply Company, Pittsburgh; second vice-president, J. W. Wright, J. W. Wright & Co., St. Louis, Mo. Executive Committee: Henry Prentiss, Prentiss Tool & Supply Company, New York; Charles S. Farquhar, Chandler & Farquhar Company, Boston; O. T. Webb, O. L. Packard Machine Company, Milwaukee, Wis.; Fred B. Scott, Syracuse Supply Company, Syracuse, N. Y.

Advisory Board.—Past Presidents E. E. Strong, Strong, Carlisle & Hammond Company, Cleveland, Ohio;

George Puchta, Queen City Supply Company, Cincinnati, Ohio.

Entertainment and Banquet.

A committee, consisting of representatives of the following companies acted as hosts in providing elaborate entertainment for the visiting manufacturers and dealers:

Acheson Mfg. Co.
American Axe & Tool Co.
American Sheet & Tin Plate Co.
American Steel & Wire Co.
Ames Shovel & Tool Co.
Bailey-Farrell Mfg. Co.
Baird Machinery Co.
Best Mfg. Co.
Brown & Co., Inc.
Brown & Zortman Machinery Co.
A. M. Byers Co.
Carnegie Steel Co.
Chaplin-Fulton Mfg. Co.
Chicago Pneumatic Tool Co.
H. L. Childs & Co.
Columbia Steel & Shafting Co.
Crucible Steel Co.
Dodge Mfg. Co.
Duff Mfg. Co.
Firth-Sterling Steel Co.
Frick & Lindsay Co.
Garland Nut & Rivet Co.
Gem Mfg. Co.
Graham Nut Co.
Hartley-Rose Belting Co.
H. J. Heinz Co.
Homestead Valve Mfg. Co.
Hubbard & Co.
Hukill-Hunter Co.
Hussey-Binns Shovel Co.
C. G. Hussey & Co.
Iron City Tool Works.
Jenkins Bros.
Johnstone, Moorehouse & Dickey.
Jones & Laughlin Steel Co.
Klein-Logan Co.
Follansbee Bros. Co.
La Belle Iron Works.
Edward R. Ladew Estate.
Lockhart Iron & Steel Co.
Machinists Supply Co.
Manning, Maxwell & Moore.
George D. McIlvaine Co.
McKenna Bros. Brass Co.
Messenger-Pringle Co.
Monongahela Tube Co.
E. W. Mudge & Co.
National Bolt & Nut Co.
National Supply Co.
National Tube Co.
Neely Nut & Bolt Co.
Oil Well Supply Co.
Oliver Iron & Steel Co.
Penna. Lubricating Co.
Penna. Steel Pulley Co.
Pittsburgh Gage & Supply Co.
Pittsburgh Screw & Bolt Co.
Pittsburgh Steel Co.
Pittsburgh Supply Co.
Pittsburgh Valve, Foundry & Construction Co.
Reliance Tube Co.
Republic Iron & Steel Co.
Somers, Titler & Todd Co.
Spang, Chalfant & Co.
Standard Chain Co.
Standard Gauge Steel Co.
Standard Supply & Equipment Co.
C. A. Turner, Inc.
P. Wall Mfg. Co.
Westinghouse Electric & Mfg. Co.
Wheeling Steel & Iron Co.
Joseph Woodwell Co.
Youngstown Sheet & Tube Co.
Pittsburgh Valve & Fittings Co.

A magnificent complimentary banquet was given in the grand banquet hall of the Fort Pitt Hotel on Thursday evening. Henry B. Lupton of the Oliver Iron & Steel Company made a delightful toastmaster, and Hon. John M. Allen of Mississippi and Hon. J. Adam Bede of Minnesota charmed the diners with their oratory. U. S. Senator George T. Oliver, who was scheduled to speak, was absent, and his address was read by Toastmaster Lupton.

On Wednesday night a theatre party, followed by a Dutch lunch at the hotel, was given. Throughout the entire meeting the ladies were cared for by a special committee, which provided automobile parties, luncheons, &c.

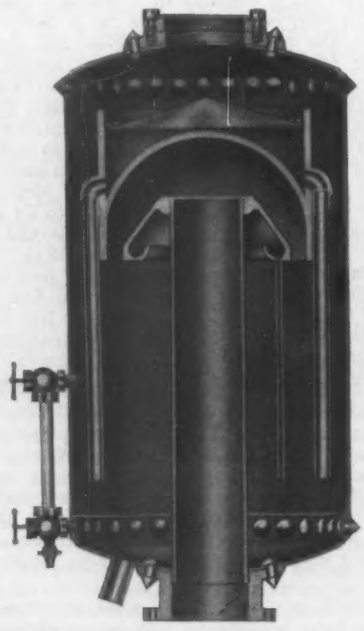
The Risley Receiver and Separator.

By virtue of the special construction adopted the separator made by the Charles B. Risley Appliance Company, Princeton, Ind., is claimed to be exceptionally effective in separating water from steam. The accompanying illustration giving a section of the separator shows quite clearly the construction and the course of the steam. The steam enters at the top and impinges on a noncorrosive screen covering the reservoir beneath it. This diffuses the steam and the water passes through the screen into the reservoir, from the bottom of which it is drained through the drip pipe shown. The screen prevents any tendency of the water to splash or react, whereby it might get back into the steam. This constitutes the first separation.

The second separation is the most important and effective one. The steam passing from the top down around the sides of the reservoir and between it and the shell must reverse its course and turn upward before it can pass out to the engine or other steam using apparatus supplied. Centrifugal force and gravity act to throw the moisture toward the bottom or toward the central pipe, down the outside of which it drains to the bottom of the separator. Any water which succeeds in turning upward is caught in the gutter around the lower edge of the conical head surmounting the central pipe. The dry steam passes through the opening between the conical head and the dome shaped bonnet over it before it can enter the open top of the central pipe. The opening between the head and bonnet is as small as allowable; its area is approximately one and one-half times that of the pipe.

It will be seen from the above that the direct flow of the steam is broken, which makes it possible to separate out all water; the steam is re-collected by an equal draft from all parts of the drum, preventing water from being carried along with the main flow of the steam. The water retained by the flange on the lower edge of the conical head is drained through the smaller pipe shown, and with that from the upper reservoir collects with the remainder of the water draining down the sides of the separator shell and central pipe at the bottom of the chamber, and is withdrawn through the bottom to a steam trap.

The separator is guaranteed to deliver steam 99½ per cent. dry and to separate all water from the steam up to the capacity of the outlet drain. In tests of the separator water has been pumped into the steam pipe directly and in quantities more than sufficient to supply the boilers without any of the water being passed from the separator on to the engine. This test was made with an installation in the Owensville, Ind., electric light plant, and as much water was forced into the device as could be passed by the 1-in. outlet.



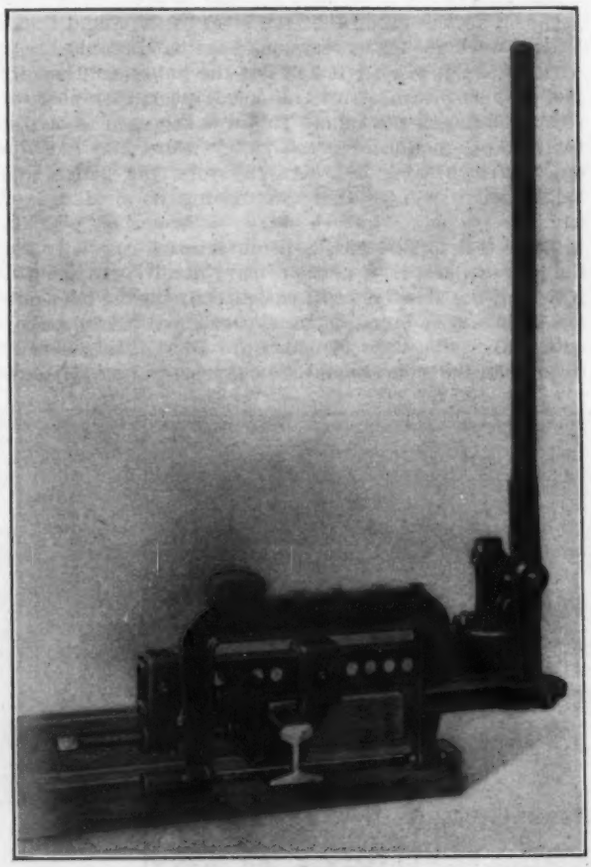
The New Steam Receiver and Separator Made by the Charles B. Risley Appliance Company, Princeton, Ind.

A number of sizes of the separator are made, and the range of capacities is sufficient to allow a considerable latitude, so that, instead of approximating the size of separator required for a given service, one exactly suited may be selected.

Automatic electric weighing and recording scales are soon to be installed by the United States Government on the New York City docks. The Treasury Department is now advertising for bids on the construction of 20 such machines. The inventor of the machine is Frank Davis, who, together with F. J. Blake, an expert connected with the Treasury Department, has been working on it at the United States mint for several years. The United States Government has exclusive control of the patent, but a small royalty is to be paid to the inventor. The statement is made that the inventor was secured through an advertisement by the Government, after scale manufacturers had refused to consider a proposition to build scales of this kind. It is said that these scales will obviate all possible frauds in weighing.

The New M. S. W. Portable Hack Saw Machine.

What is believed to be the only portable hack saw machine of its kind made in this country is offered by the Massachusetts Saw Works, Chicopee, Mass. It is a hand operated device, but different from the usual hand hack saw in that the saw is rigidly supported as it would



The Portable Hand Operated Hack Saw Machine Made by the Massachusetts Saw Works, Chicopee, Mass.

be in a power saw, and the reciprocating motion is applied through a long lever which is particularly convenient when the work is close to the ground or floor as in the illustration. This machine will cut through a 9-in. rail or an I-beam at any angle up to 45 degrees. It is compact and is easily operated by one man. It weighs when set up ready to run about 90 lb. A 9-in. I-beam can be cut through easily in from 25 to 30 min. when there is no stop for resting. The saws in this machine, it is claimed, make a clean straight cut, and the danger of their breaking is reduced to a minimum. The machine is adapted to take 14-in. blades, which are of a special type called the Victor special P blade, particularly developed by the company for use in this machine. The new blade has been found to give better satisfaction in I-beam or rail work than any other blade that has been tested.

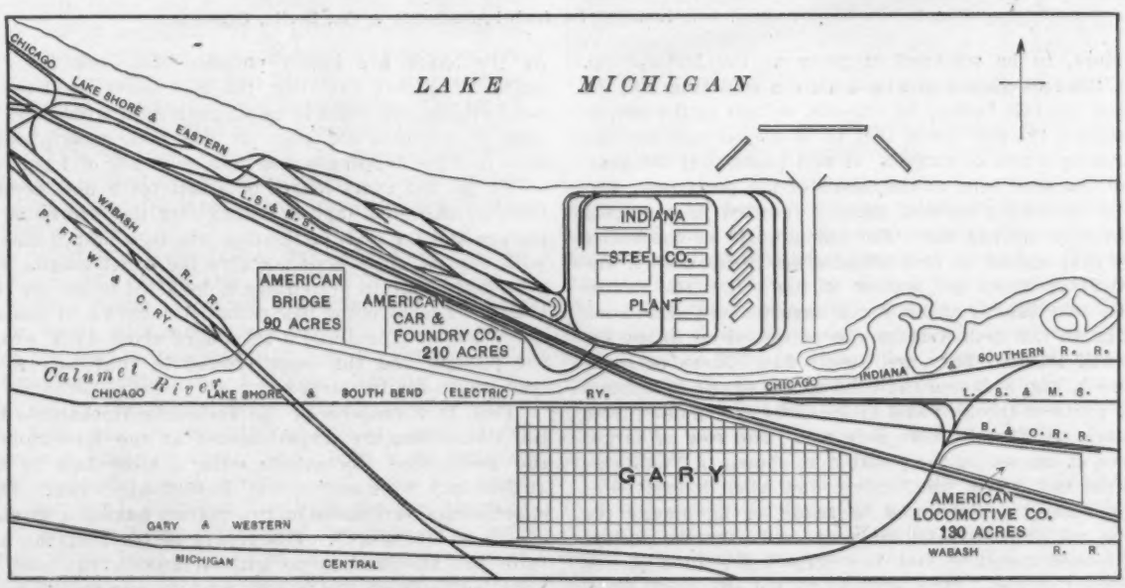
Advantages are claimed for this machine over old methods of doing similar work; for example, the portable circular saw machine is relatively heavy and clumsy compared to this machine, and requires two men to set it up and operate it, while the hack saw frame usually is operated by two men for such heavy work, is tedious to use, and unless the men are experienced they are apt to break or dull a great many blades through trying to cut too fast. One of these machines has been in use by a large traction company for some time, and is stated to have given splendid satisfaction.

Car, Locomotive and Bridge Plants at Gary.

The accompanying map, reproduced from the *Railway Age-Gazette*, shows the sites of the proposed plants of the American Car & Foundry Company, the American Bridge Company and the American Locomotive Company, in their relation to the Indiana Steel Company's works, the town of Gary, Ind., and the main lines of the Lake Shore, the Wabash and the Baltimore & Ohio railroads.

The plant of the American Car & Foundry Company will be directly northwest from the town of Gary, with the Calumet River as its southern boundary and with the freight classification yards of the Chicago, Lake Shore & Eastern and the Lake Shore main line on the north. This plant occupies 210 acres. Directly west is the site of the future plant of the American Bridge Company, occupying 90 acres. The proposed new plant of the American Locomotive Company will be located along the east line of the corporate limits of Gary and south of the Baltimore & Ohio and the Lake Shore main lines, the tract comprising 130 acres.

The map shows also the new location of these lines, as well as that of the Chicago, Indiana & Southern. When the plans of the Indiana Steel Company were completed it was found that the mills would require about 1000 acres in one compact body. This involved the entire removal of the Baltimore & Ohio and the Chicago, Indiana & Southern, as they ran diagonally across part of the site. These lines were moved south and are now located between the steel works and the town of Gary.


LAKE MICHIGAN
CHICAGO LAKE SHORE & EASTERN
L. S. & M. S.
WABASH R. R.
P. FT. W. & C. RY.
AMERICAN BRIDGE 90 ACRES
AMERICAN CAR & FOUNDRY CO. 210 ACRES
INDIANA STEEL CO. PLANT
Calumet River
CHICAGO LAKE SHORE & SOUTH BEND (ELECTRIC) RY.
CHICAGO INDIANA & SOUTHERN R. R.
L. S. & M. S.
B. & O. R. R.
GARY
AMERICAN LOCOMOTIVE CO. 130 ACRES
GARY & WESTERN
MICHIGAN CENTRAL
WABASH R. R.

Sites of Proposed Railroad Equipment Plants at Gary, Ind.

They are elevated at this point so as to eliminate the grade crossing of the main street, Broadway, which is the principal avenue of communication between the town and the works.

German Steel Belts for Transmitting Power.

BY H. PRIME KIEFFER.

Steel belts are being introduced in Germany, and many large factories and power stations have installed them with excellent results. The most difficult problem has been the finding of a suitable means of locking the ends of the belt. The one invented by D. Eloesser, architect to the German Government, and now at the head of the Eloesser Kraftband Gesellschaft in Berlin, appears to be especially successful. The lock consists of two parts, one for each end of the steel belt. These parts, when the belt is ready to be installed, are locked into each other and screwed together. In each part of the lock one end of the steel belt is secured not only by screws but by soldering as well. Fig. 1 shows a typical installation of one of this firm's steel belts and on the floor the leather belt which it replaced.

The first locks which were made were all in one piece, as shown in Fig. 2, and the ends of the steel band had, therefore, to be soldered in place at the installation. With the lock shown in Fig. 3 all the soldering may be done at the belt factory by experts, so that at the receiving station the belt needs only to be locked together and secured by a row of screws. It was found that the heating of the steel band at the hands of the purchaser, during the soldering process, usually resulted in damaging the belt by overheating. The temperature of the solder in no case should be over 200 degrees C., as even a low overheating ruins the temper of the belt. The curves of the two flanges of the locks have to be designed according to the diameters of the pulleys over which the belt will travel. They are nearly flat. Rows of small screws *b*, Fig. 3, fasten the ends of the bands to the two main parts of the lock and to the little triangular pieces of steel, *c*. That is their only use. The row of larger screws, *a*, are set in the position as shown in Fig. 3, before the belt leaves the factory, and when it arrives at the purchaser's plant and is ready to be placed the screws are removed; the belt is placed over the pulleys and locked together and the screws are then placed through the lock. The screws do not go clear down through the belt. This is the type of lock that is now being made almost exclusively.

In the old lock the top piece was all one piece. When it reaches the purchaser and is ready to be placed the screws are taken out of the band, the band is slipped in the little slot provided for it and soldered and the screws again placed in it. There are five sizes of curves for different diameters of pulleys and only five. One should naturally infer from this that the mathematical formula by which this curve was worked out is only an approximate one. It must be understood in this connection that the locks used on small pulleys are also very small and the curved flanges in these cases are very nearly flat. These flanges are made long because in practice and experiment it was found that the steel bands would break if they were not made very long; the band would break with a snap just after it had left the pulley and usually just a short distance from the small triangular piece of steel underneath the band. This was supposed to be due to its rapid motion over the pulley wheel and then its quick straightening out. At any rate, the flange was lengthened and now they are having no breakage of bands.

The steel for the belt is manufactured especially for the purpose, and is of extraordinary quality and temper. Although the steel belt will run directly on the bare pulley, it has been found advantageous to cover the pulley with sheets of canvas to which are glued thin sheets of cork. This is done to absolutely prevent any slipping.

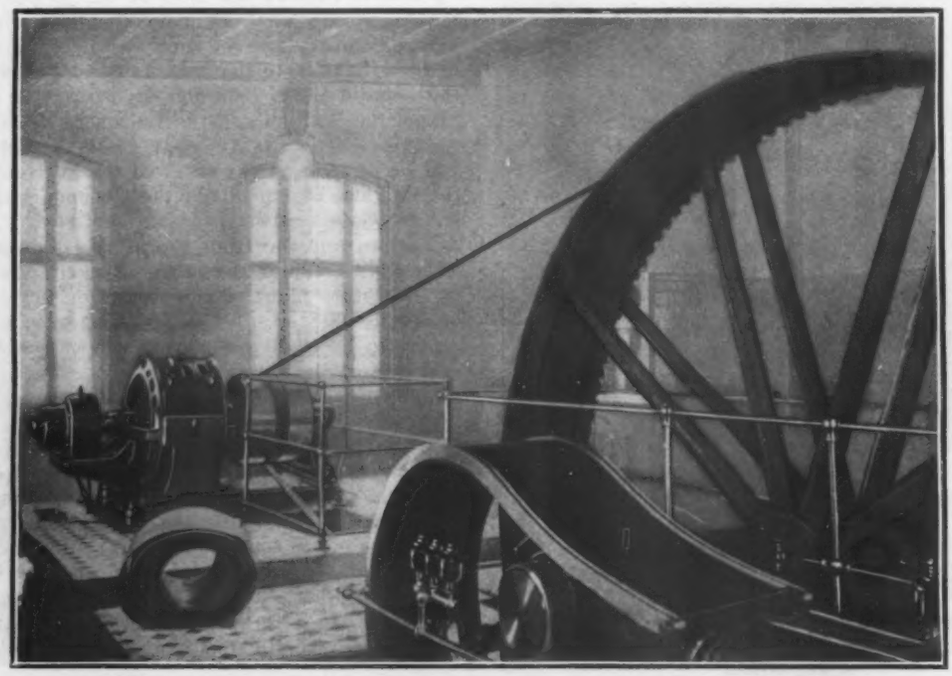


Fig. 1.—An Eloesser Steel Belt Installed for Ludwig Sudicatis & Co., Berlin, Germany.

As the bands are highly polished this cork lasts for years. The very fact that the cork covering shows no wear proves that there is no slipping, as it would not last long if the belts did slip. It has been ascertained in tests that the slipping is less than one-tenth of 1 per cent.

To get the exact length of a belt for a new installation, a small steel tape is placed over the crowns of the pulleys and the ends of the tape are then lapped and cut with shears. This does not give the exact length, however, and a certain percentage is deducted to get the right length. The inventor has patented a device to measure the length of tape under a tension of about 45 lb. around the pulleys, and the length found in that way is the true length for the steel belt.

Prof. R. Kammerer of the Techniche Hochschule Berlin, Charlottenburg, experimented at the laboratory of the Technische Hochschule with a steel belt 10 mm. (0.3937 in.) wide and ½ mm. (0.0197 in.) thick. These experiments were made on two pulleys having a diameter of 2.5 m. (98½ in.). His report states that the steel belts ran absolutely true without guides, ran over the metal surfaces on the pulleys without any covering, and ran as quietly, noiselessly and as steadily at a velocity of 61.5 m. (201.78 ft.) per second as at a velocity of 13 m. (42.65 ft.) per second. The steel belt transmitted a maximum of 146 hp. at a tension of 200 kg. (44.9 lb.). The maximum slipping was 0.15 of 1 per cent. The loss of power by the belt, even with small loads and great

velocities, was very small, generally within the limit of errors of measurement. No stretching of the belt during experiments was observed.

The advantages to be derived from the use of steel belts are important. They transmit power virtually without any loss, and will, therefore, effect a saving of coal. The loss is scarcely to be detected by scientific measurements. There is absolutely no slipping whether the loads are continuous or of great and sudden variations. The power is transmitted exactly in the proportions of the pulley diameters. Steel belts do not stretch, and there is, therefore, no necessity for taking up slack. The width of steel belts vary from one-third to one-tenth that of leather belts of equal capacity, consequently there is a saving in the cost of pulleys, as they can be much narrower, and there is also more light in the workshops. Steel belts do not wear. These belts are used in hot or damp or dusty places, and it is claimed are not affected by the fumes of acids. They permit velocities up to 100 m. (325 ft.) per second, or about 19,500 ft. per minute, and could, therefore, be readily used on turbines. As the tension of steel belts is about one-tenth of that of leather belts of equal capacity, and on account of their

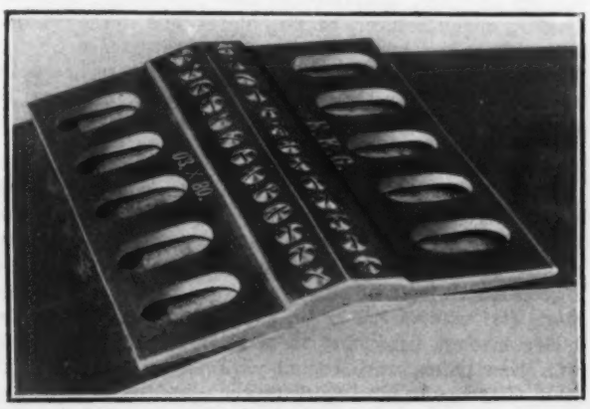


Fig. 2.—The Belt Lock Formerly Used.

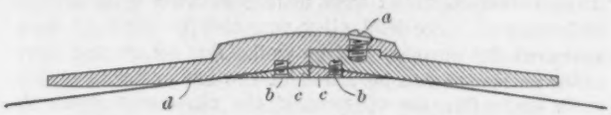


Fig. 3.—Section of the Improved Form of Belt Connector.

light weight, steel belts save the bearings and reduce the heating of them. They save space, as the effectiveness of steel belts is not governed by distance of centers. They are perfectly clean and run without noise. Steel belts work as true in perpendicular as in horizontal positions, and have been employed in many cases where cog wheels were formerly used. They can be used for transmission of one-tenth to several thousand horsepower. The manufacturers claim them also to be cheaper than leather belting. This is true, especially, in comparison with leather belts of first quality and correct proportions, and more so, of course, for large power transcission and complete plants.

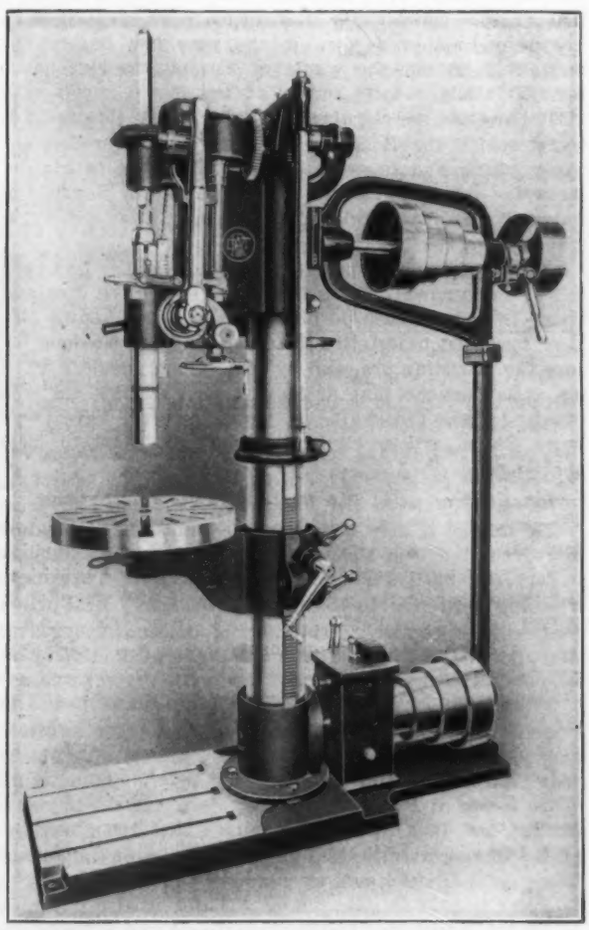
The oldest steel belts in use have now been running a little over two years. One firm, that of Ludwig Sudicatis & Co., Berlin, replaced a leather belt 600 mm. (23.6 in. wide) with a steel belt 100 mm. (3.9 in.) wide. This is the installation shown in Fig. 1. Owing to the load changing abruptly they had great difficulty with the leather belt. The steel belt has been running since March, 1907, and transmits about 250 hp. without developing any faults or stretching. There is no wear on the belt or on the pulley covering, and there has never been a hot box. Although the load changes abruptly there is absolutely no slipping of the belt. The only objection to the belts seem to be that they might prove dangerous owing to their extreme thinness and might injure the unwary. All such belts should be inclosed by a protecting screen.

The output of tubular products by the National Tube Company, Pittsburgh, in April was the largest made in any one month for more than a year.

The Robertson 22-In. Drill.

A rigid, accurate and convenient tool for handling work rapidly is what the Robertson Drill & Tool Company, Buffalo, N. Y., sought to produce in the 22-in. drilling and tapping machine illustrated. It will be noted that the column is bolted to the base, which is heavy and ribbed to resist extra strain, and that the column is provided with a back support bracket, which further insures stiffness. The power is transmitted from the top countershaft to the lower shaft by a 2¾-in. belt running on four-step cone pulleys of large diameter.

Except with respect to the drive the machine is similar to the 21-in. drill of the same maker, described in *The Iron Age* April 22, 1909. On the lower shaft is shown the back gear box, which can be thrown to drive direct from the belt or through the back gear, while the



A New 22-In. Drilling and Tapping Machine, Built by the Robertson Drill & Tool Company, Buffalo, N. Y.

machine is in motion. In the center of the column is a vertical shaft driven by miter gears at the lower end. At the top are three miter gears and a clutch. Through this mechanism the forward and reverse motions are obtained, or the machine stopped under the control of the lever shown extending down the side of the column. The feed is geared and has 24 changes. The spindle through the quill is 1¾ in. in diameter and through the crown gear is square, giving an equal drive; no splines or keys are used. The spindle socket conforms to the No. 4 Morse taper.

The machine is furnished with wheel, lever and power feed with automatic stop. The knee is large, with a long sleeve on the column, and is raised and lowered by a crank with worm gear and pinion on the rack. The gears are all cut from the solid metal. All bevel and miter gears are generated or planed teeth. The racks are steel, cut from the solid metal. All clamps are furnished with tail nuts. The hight over all is 77 in., the floor space 18½ x 58 in., and the table diameter is 18 in. The machine drills to the center of a 21¾-in. circle. The net weight is 1450 lb.

The Manufacture of Tin Plates and Terne Plates.*

The Industry—Historically and Statistically Considered.

BY WM. G. GRAY,† PHILADELPHIA.

To Bohemia seems rightly to belong the honor of first having made tin plates commercially. Flower, an English authority on the manufacture of tin plates, says that hammered iron sheets were coated with tin in Bohemia between the years 1240 and 1600, but he was unable to ascertain in what year tin plates were first made in that country. Nor could he give the village in which they were produced in Bohemia. But that the coating of iron sheets with tin was carried on exclusively in Bohemia for many years prior to 1620, and that the process of manufacture was strictly guarded by those engaged in it, are beyond doubt. Down to the year last named not only England but the whole of Europe was dependent upon Bohemia for its supply of tin coated sheets. In 1620, however, the reigning Duke of Saxony obtained the secret which the Bohemians had carefully guarded for many years, and immediately erected works in his domain for the manufacture of tin plates. A flourishing industry was soon established and many thousand workmen were given employment.

Tin was early discovered in England, and it had been mined in Cornwall for many centuries before England began to manufacture tin plates. It is a well-known fact that Tyre and other cities in Phœnicia used tin long before the Christian era, and by some of our modern writers it is thought that at least a part of this tin was obtained from Cornwall. It may, however, have come from China, whose civilization is from 4000 to 5000 years old.

Establishment of Tin Plate Making in England.

Be this as it may, it is beyond doubt that the industry of coating iron sheets with tin was not established in England until about 1665, when Andrew Yarranton, who had been sent to Saxony by a company of English gentlemen to acquire a knowledge of the art, returned to England and established a small plant at Pontypool in Monmouthshire. For several reasons the project was not a commercial success and it was soon abandoned, and England was again compelled to depend upon Bohemia and Germany for her supply of tin plates. About the year 1720 Major John Hanbury took up the manufacture of tin plates at Pontypool. His project was entirely successful, and it is to Major Hanbury that the honor belongs of successfully establishing this most important industry on British soil.

Prior to 1728 all iron plates or sheets used for tinning or for other purposes had been produced under hammers, but in the year named the art of producing sheets or plates by means of hot rolls was invented in England. Sheets made under hammers naturally varied in thickness, but by the use of rolls sheets of uniform thickness were readily produced. The industry grew apace in Great Britain, and British made tin plates soon displaced in the home market the crude hammered sheets of German and Bohemian manufacture, for Germany had long before established a flourishing tin plate industry.

Making Tin Plate in France.

Just a word about the early tin plate industry of France. Several abortive attempts to establish the manufacture of tin plates in that country appear to have been made prior to 1700, but it was not until about 1714 that a plant was established at Mansvaux and the manufacture of tin plates successfully accomplished. This was about six years prior to the time when Major Hanbury started his works at Pontypool in England. Another tin plate plant was established in France in 1733; another in 1745, and still another in 1751. France still makes tin plates and terne plates, the production in 1907 amounting to about 80,617,000 lb. Bohemia, the original home of the industry, is still a manufacturer of tin plates, and so, too, are Moravia and Styria. Spain and Italy have made tin plates for years. In 1906 Italy turned out about 36,365,000 lb., and in 1907 Spain produced about 35,250,000 lb. Italy also imported about 30,000,000 lb. in 1906. Belgium and Russia are also manufacturers. Belgium imported over 18,000,000 lb. in 1908. Germany, as already stated, made tin plates long before they were manufactured in England, and she is to-day quite a large manufacturer. In 1907 Germany made about 100,000,000 lb. of tin plates. She is also a large importer, obtaining a large part of her supply from Great Britain. Her imports from all countries in 1908 amounted to about 90,000,000 lb., and her exports to about 535.000 lb. But England has been for many years the leading manufacturer of tin plates and terne plates, although to-day her lead is seriously threatened by the United States, which in the last 15 or 18 years has built up a tin plate industry that is soon to lead the world in production if it does not already do so.

The First Terne Plate.

You have doubtless noticed that in what has been said no reference has been made to terne or roofing plates, in which many of you gentlemen are perhaps more vitally interested than in tin or bright plates. Diligent search has failed to discover the year when terne plates were first made. Nor could the country which had the honor of first producing them be found. It is known that iron plates were coated with an alloy of tin and lead early in the nineteenth century, and possibly in the eighteenth century, but these plates were used for tea trays, salvers, &c., and were usually painted or decorated or lacquered. The lead alloy was cheaper than tin and answered the purpose just as well. But for roofing purposes no record can be found of the use of terne plates until long after the opening of the nineteenth century. Flower, the English authority already mentioned, seems to incline to the opinion that terne plates were first made in France. The word is derived from the French, and means dull or tarnished. Flower is apparently convinced that the honor of first manufacturing them does not belong to England.

In 1830 imported British tin plates were purchased and run through a bath of molten lead by a Philadelphia firm. The sheets were 10 x 14 in. The coated sheets were sold for roofing purposes and were of good quality. Further particulars concerning their manufacture can be obtained from the N. & G. Taylor Company of Philadelphia. A letter received from this company a few years ago relating to the manufacture of these says: "News of the sale of so novel an article soon found its way across the water, and terne plates commenced to be made there"—that is, in Great Britain. Even to this day terne plates are not used extensively for roofing purposes in Europe, zinc sheets being commonly used instead.

Bright Plates for Roofing.

Prior to the manufacture of terne plates for roofing bright plates, 10 x 14 in. in size, were frequently used for that purpose. As a rule these plates were of about No. 27 gauge. Many years ago a number of roofs in Philadelphia were covered with tin plates instead of terne plates, and it is said that some of these plates are to-day in almost as good condition as when first laid. They were very heavily coated with tin. Bright plates are still used in this city for roofing purposes, but the quantity so used is not large. In the United States during the period following the Civil War large quantities of bright plates were sold for roofing purposes throughout the West, especially in the dry mountainous districts. Bright plates were also used largely for roofing purposes in Can-

* Paper, practically in full, read before meeting of Philadelphia Master Tin and Sheet Metal Workers' Association, April 14.

† Statistician of American Iron and Steel Association.

ada. These plates, which are unpainted, shine out brilliantly in the sun. Some 30 or 40 years ago they cost in Canada from $10 to $12 per box. It is claimed that some of the bright plates placed on roofs in Quebec and other Canadian cities over three-quarters of a century ago are still in good condition.

Terne Plates in Great Britain.

The earliest mention we can find of terne plates in Great Britain is contained in an address on the tin plate industry by Thos. William Booker, High Sheriff of Glamorganshire, delivered in 1848, about 18 years after the Philadelphia roofing plates had been made. Mr. Booker in the course of his remarks said: "A small proportion of the plates manufactured in my district are of dull appearance. These are for a special purpose, lead being used in their manufacture." No mention was made of "terne plates." In 1851, however, "tin and terne plates" appear in the list of exports from Great Britain. The "dull" plates mentioned by Mr. Booker were probably iron plates coated with a mixture of tin and lead, although they may have been coated with lead only. No mention whatever is made of terne plates in the iron and steel exports from Great Britain in 1848.

Exact statistics of the yearly production of tin plates and terne plates in Great Britain are not collected. But close estimates are annually made by the British Iron Trade Association, and it is to this association that we are indebted for the following information:

Statistics of Production in Great Britain.

The production of tin plates, terne plates and black plates for tinning in Great Britain in 1905 was estimated at 644,300 tons. In the same year the exports amounted to 354,864 tons of tin plates and terne plates and 68,839 tons of black plates. In 1906 the exports reached 441,112 tons, an increase of 17,400 tons. Domestic consumption also increased it was said about 20,000 tons, giving a total production in 1906 of 681,000 tons. Prior to 1906 the greatest production reached was in 1891, when the estimated output was 663,000 tons. To produce the 644,300 tons of tin plates, terne plates and black plates turned out in 1905 it is estimated that about 769,000 tons of steel bars and 10,000 tons of tin were required; in addition, coal worth about $1,400,000, wooden boxes worth $850,000, vitriol worth $450,000 and palm oil worth $275,000 were consumed. About 19,800 persons were given employment, who were paid about $7,000,000 in wages. Of course, these figures would be increased considerably if the 1906 production were used. But they will serve to give an idea of the importance to Great Britain of its tin and terne plate industry.

As stated above Great Britain is a large exporter of both bright and dull plates. She also exports considerable quantities of black plates for tinning. In the calendar year 1908 her exports of tin plates and terne plates amounted to 403,007 gross tons, as compared with 405,328 tons in 1907. Of the exports in 1908 the United States took 60,602 tons; the British East Indies, 46,144 tons; Germany, 31,139 tons; the Netherlands, 25,469 tons; France, 24,639 tons; Australia, 18,671 tons, and Canada, 17,808 tons. Russia, Belgium and Portugal were also fairly large importers. Of the black plates for tinning which were exported in 1908 Russia took over one-fourth and Germany and Belgium were both rather heavy importers. The home consumption of tin plates and terne plates in Great Britain is estimated at from 200,000 gross tons to 300,000 tons annually.

The Development of the Industry in America.

The manufacture of household and culinary articles from sheet metal has been carried on in the United States for many years. Tin plates and iron black plates were chiefly used for this purpose, the articles being stamped from a single blank. At first only shallow articles were made, such as pie plates and pot covers, but about 1860 a machine was devised for the manufacture of deeper wares, such as milk pans, washbowls, cake pans, and, finally, dish pans. Tin plates were largely used in the production of all of the articles named. In the process of manufacture, however, they lost their luster, and had to be redipped in liquid tin. Frequently black plates were stamped into shape and then tinned. For some articles, such as ladles, skimmers, &c., black iron sheets were always used, being first stamped into shape and then put through the tinning process.

The first attempt in the United States to make tin or terne plates for the general market appears to have been in 1872. In the spring of that year a small dipping plant was built in Pittsburgh, Pa., by four Welshmen. This little plant was put in operation in June, 1872. Both tin plates and terne plates were successfully made, and were readily disposed of at good prices. It was this little dipping plant at Pittsburgh which led to the erection of tin plate works at Wellsville, Ohio, and at Demmler, Pa., in 1873, the machinery and tinning pots being removed from Pittsburgh to Wellsville in the summer of that year. Evan H. Davies was subsequently connected with the Wellsville plant, and Wm. Oak Davies with the Demmler works.

The Pioneer American Plants.

The pioneer plants for the combined manufacture of black plates and tin and terne plates were established in the United States in 1873 and 1874 by Rogers & Burchfield at Leechburg, Pa.; the American Tin Plate Company at Wellsville, Ohio, and the United States Iron & Tin Plate Company at Demmler, Pa.

The rolling mills for the Leechburg enterprise were erected about 1872, or perhaps earlier. It was at these mills in 1874 that natural gas was first used as fuel in the manufacture of iron. The tin and terne plate department was added in 1874, and terne plates were first produced in the same year. Tin plates were made in either 1874 or 1875. In the latter year the firm failed, and in May, 1877, the works were sold by the creditors. The purchasers, Kirkpatrick, Beale & Co., produced only terne plates in their tinning department from 1877 to 1880. In the latter year they were compelled to give up the manufacture of terne plates on account of the low prices then prevailing for imported plates. The rolling mill department was not closed, however, but continued to run on fine grades of sheet iron and sheet steel suitable for the manufacture of stamped ware. The tin and terne plate department was permanently abandoned in 1880.

In 1873 the American Tin Plate Company completed a rolling mill and a tin and terne plate plant at Wellsville, Ohio, the rolling mill being put in operation in September of that year. The first terne plates were produced in November, 1873, and in the spring of 1874 its first tin plates were turned out. In all, about 530 boxes of 14 x 20 bright plates were produced. The manufacture of both tin and terne plates was discontinued permanently in October, 1874.

The United States Iron & Tin Plate Company erected works at Demmler, Pa., in 1873-74, for the manufacture of black plates and tin and terne plates. Terne plates were first made in 1874 and in the following year tin plates were also produced. The black plates consumed in the dipping plant were produced in the rolling mill of the company. In 1877 the coating of iron or steel sheets with tin or with tin and lead was suspended, but black plates were still manufactured for the production of show cards, tea trays, black stamped ware, &c. In 1879 the manufacture of tin and terne plates was resumed, but in 1880 it was again discontinued, the company for a decade thereafter confining its operations to its rolling mill and to the production of specialties in fine sheet iron and sheet steel. In 1890 the manufacture of tin and terne plates was again revived.

Tin plates were produced about 1874 or 1875 by the Iron Clad Can Company at its works at Brooklyn, N. Y. This company, which subsequently changed its name to the Iron Clad Mfg. Company, consumed in the manufacture of heavy "railroad" milk cans, &c., practically all the tin plates it produced.

In 1876 or 1877 the Monitor Tin Plate Company began to manufacture tin plates for sale at its works at Horatio and Water streets, New York City. The black plates after being tinned were sold to manufacturers of milk cans, stamped ware, &c. The tinning of black plates was discontinued in 1878 or 1879. Neither of these plants made terne plates, but the Iron Clad Mfg. Company made

at one time stamped iron shingles and coated them with terne metal.

The Introduction of Steel Base Plates.

All the early enterprises named above used charcoal iron sheets for the manufacture of both tin and terne plates. It was not until about 1876 that steel sheets were experimentally used by the United States Iron & Tin Plate Company, at Demmler, Pa. Some three or four years later establishments in England and Wales began to coat steel sheets with tin.

The great growth in the manufacture of tin and terne plates in the United States has taken place since 1890. The production increased from about 2,236,700 lb. in 1891 (of which only 368,400 lb. were tin plates and 1,868,300 lb. were terne plates) to 254,611,395 lb. in 1895, of which 165,927,907 lb. were tin plates and 88,683,488 lb. were terne plates. In 1900 the production had more than trebled, the output amounting to 849,004,022 lb., of which 707,718,239 lb. were tin plates and 141,285,783 lb. were terne plates. In 1905 the output reached 1,105,440,000 lb., but tin plates were not separated from terne plates. In 1906 the maximum production of 1,293,740,000 lb. was reached, tin plates contributing 1,100,373,000 lb. to the total, or about 85 per cent., and terne plates 193,367,000 lb., or about 15 per cent. In 1907 the production fell to 1,153,097,000 lb., of which 996,650,000 lb. were tin plates and 156,447,000 lb. were terne plates. The production for 1908 has not as yet been compiled, but the figures will undoubtedly show a sharp falling off as compared with either 1906 or 1907.

The Revival of the American Industry.

Let us glance briefly at our tin plate history by States, especially prior to or just after the passage of the McKinley tariff law in 1890.

Missouri made both tin plates and terne plates for the general market in 1889 before the McKinley bill became a law, terne plates having been made in April and tin plates in September, 1889, by the St. Louis Stamping Company, from black plates made in its own rolling mill. To this company, therefore, belongs the honor of having revived an industry that had been virtually dead for about a decade. In January, 1889, tin plates were also made by the Buhl Stamping Company at Detroit, but these plates were for the use of the company and not for sale. Terne plates were not made. In order to prove that tin plates equal to those made in foreign lands could be successfully made in this country an experimental plant was erected at Pittsburgh in the fall of 1889 in the Western Pennsylvania Exposition Building by the American Tinned Plate Association, and several hundred boxes of tin plates were produced. Terne plates were not made. The plant ran for a short time and was dismantled.

In Pennsylvania both tin plates and terne plates were made early in 1890 by the United States Iron & Tin Plate Mfg. Company at Demmler, John Hamilton produced terne plates at Pittsburgh in April of the same year, and in June the Pittsburgh Electro Plating Company made terne plates at Apollo. In the eastern part of the State the Penn Treaty Iron Works made terne plates in January and tin plates in April, 1891. In the same year the N. & G. Taylor Company produced terne plates in April and tin plates in November. Other plants for the manufacture of tin plates and terne plates were shortly established, and Pennsylvania soon became the leading State in the manufacture of tin plates and terne plates, a position which it still holds.

In Indiana the Anderson Tin Plate Company began to manufacture tin plates and terne plates at Anderson in the summer and fall of 1891. Its first box of tin plates was made on July 4, and in October terne plates were first turned out. A number of other plants soon followed, and Indiana shortly had a flourishing tin plate industry, ranking second in 1900 in the quantity and value of the tin plates and terne plates produced in that year. In 1908 it had four tin plate and terne plate plants.

As already stated, Ohio made terne plates as early as 1873 and tin plates as early as 1874, but in the year last named the manufacture of both products was abandoned. It was not until 1891 that their manufacture was revived, terne plates being turned out in August of that year by the Cincinnati Corrugating Company at Piqua. In October, 1891, the Cleveland Tin Plate Company made tin plates at Cleveland, and in December it made terne plates. In 1891 and subsequent years a number of other tin plate and terne plants were erected within the boundaries of the State, and in the census year 1900 Ohio ranked third in the quantity and value of the tin plates and terne plates made.

Illinois made tin plates from imported black plates in November, 1890, at Maywood. The plant was operated by Norton Bros. Terne plates were not made. The Chicago Stamping Company also made tin plates in January, 1892, and in 1893 tin plates were also made by the Burn Mfg. Company. Terne plates were not made in Illinois until September, 1893, when they were turned out by the Chicago Tin Plate Mfg. Company of Chicago.

West Virginia made its first tin plates and terne plates in 1894, and Maryland made tin plates in 1892 and possibly terne plates as well. New York, which made tin plates as early as 1876 or 1877, and gave up their manufacture in 1879, did not resume making them until 1892, when a plant was established at Brooklyn. In 1891 terne plates were first made in this State by a plant in New York City.

As already stated, Michigan made tin plates as early as 1889, but terne plates were not made until 1900. Kentucky first made tin plates in March and terne plates in August, 1895, while Virginia made tin plates and terne plates for the first time in November, 1894, and New Jersey made its first terne plates in October and its first tin plates in December, 1892.

In the calendar year 1907 the States which made tin or terne plates were New York, Pennsylvania, West Virginia, Ohio, Indiana, Illinois and Michigan. The combined production of these States in this year has already been given.

Imports of Tin Plates and Terne Plates.

This country has long been a heavy importer of both tin plates and terne plates. In 1869 we imported 181,619,000 lb. valued at the port of shipment at $8,767,000. In 1879 our imports amounted to 276,537,000 lb. and were valued at $10,147,000. In the next 10 years the imports jumped to 735,779,000 lb. and the value to $21,222,653. In 1891 the maximum was reached both in quantity and value, the quantity imported reaching the enormous total of 1,036,489,000 lb. valued at $35,746,000. The value of the tin plates and terne plates imported in this year was almost double the total imports of all kinds of iron and steel in the calendar year 1908, when the value amounted to only $19,957,261. The quantity of tin plates and terne plates imported in 1891 was over 10,000,000 lb. in excess of our total production as late as 1904.

In 1899 the quantity imported fell to 108,484,826 lb. and the value to $2,613,564, but in 1908 the imports had increased to 140,739,972 lb. valued at $4,291,953. All of the above figures have been obtained from governmental sources and are for the fiscal year ended June 30. Virtually all of the tin plates imported in late years are for the use of canners, &c., and are re-exported in filled packages, when 99 per cent. of the duty of 1½ cents per pound is returned by the Government.

From Governmental sources we learn that in the fiscal year ended on June 30, 1908, the duty paid on imported tin plate amounted to $2,104,415, and that in the same fiscal year the drawback paid by the Government on imported tin plates that had been re-exported amounted to $2,239,486. In the fiscal year 1907 the duty paid on tin plates was $2,120,293 and the drawback paid was $1,525,282, while in the fiscal year 1906 the duty paid was $1,807,598 and the drawback was $1,788,762.

The Number of Plants and Wages Paid.

In the calendar year 1904, which is the latest year for which we have detailed Governmental statistics, there were 44 establishments in this country which were equipped for the manufacture of black plates for tinning or for coating tin plates or terne plates. Of these 36 had coating plants. In 1900 there were 66 plants all told, of which 57 had coating plants. In 1904 the total capital invested was $32,457,487 and in 1900 it was $27,488,302.

The salaried officials, including clerks, employed in 1904 was 861, and the salaries paid these officials was $936,682, while in 1900 the salaried officials numbered 726, who were paid $818,015. In 1904 the wage earners employed aggregated 17,164, who received $10,559,723 in wages, as compared with 14,826 wage earners in 1900, who were paid $10,288,061. The cost of the materials used in 1904 amounted to $49,016,487, as compared with $45,004,716 in 1900, while the value of the products in 1904 amounted to $65,679,117, against $61,912,619 in 1900.

Right here it might be well to call your attention to the fact that, as previously stated, in Great Britain there were 19,800 wage earners employed in 1905, who received in wages about $7,000,000, or less than $400 per wage earner, while in 1904 in the United States there were employed 17,164 wage earners who received $10,559,723 in wages, or about $615 per wage earner.

The Material Used and Its Value.

Analyzing the character and cost of the materials used in the United States in the manufacture of tin plates and terne plates, we find that of the domestic black plates consumed in 1904 911,663,989 lb. were Bessemer steel, 19,343,920 lb. were acid open hearth steel, 87,567,481 lb. were basic open hearth steel and 949,367 lb. were iron. The total value of these black plates was $22,988,237. The foreign black plates consumed amounted in 1904 to only 83,900 lb., while in 1900 there were 2,358,607 lb. of imported black plates consumed. The pig tin consumed in 1904 aggregated 24,243,851 lb., valued at $6,709,164; the pig lead, 8,201,253 lb., valued at $366,558, and the palm oil, 6,628,526 lb., valued at $376,310. The sulphuric acid, tinning flux, bran and pink meal consumed in 1904 amounted in value to $180,011, and the boxes and nails to $504,887. The total cost for fuel was $1,490,407, to which natural gas contributed $293,795. In addition $808,296 were expended for materials other than those above enumerated.

From what has been said I am sure that you will agree with me that the tin plate and terne plate industry is now one of the most important branches of the iron and steel trade of the United States. And I am also sure that you will agree with me when I say that, if we do not do so to-day, inside of a few years we will lead the world in the production of tin plates and terne plates, even as we now lead it in the production of all other leading articles of iron and steel.

American Stoves in Canada.

TORONTO, May 15, 1909.—T. J. Stewart, one of the representatives of Hamilton in the House of Commons, made a strong plea for ampler protection of the stove industry in the recent budget discussion at Ottawa. In Hamilton, he said, the stove works were busy only 14 months during the last two years. During the other 10 months the men walked the streets. In the retail stores, he added, stoves are being sold at prices which the Canadian manufacturers cannot afford to take; this is a consequence of competition from the United States, which he represented as very demoralizing since the panic of 1907. He informed the House that during the latter part of 1908 there were not less than 400 carloads of stoves shipped into Canada from across the line. All these stoves should and could, he maintained, be manufactured here if the home industry were properly protected. He would have the duty increased 10 per cent. ad valorem. C. A. C. J.

The New England Foundrymen's Association.—W. H. Carpenter of the Bristol Brass Company, Bristol, Conn., was the speaker of the evening at the monthly meeting of the New England Foundrymen's Association at the Exchange Club, Boston, May 12, his subject being brass and its preparation, handling in founding, &c. A discussion followed. President W. A. Viall was in the chair at the business meeting. The usual dinner was enjoyed. The next meeting will be the semiannual, and an elaborate programme is being arranged. It will be held in Boston, as usual.

The Decarburization of Ferroalloys.*

BY GUSTAVE GIN.

In some electrometallurgical works ferroalloys of low carbon content are made by first reducing the mineral in the presence of a suitable quantity of carbon; then the accumulated slag is tapped off, and there is placed upon the surface of the carburized metal a bath of ore which oxidizes little by little the carbon contained in the reduced metal. It is generally admitted that such decarburizing requires a prolonged superheating, the length of which varies inversely with the carbon content desired. It would seem to result from this practical observation that the decarburization becomes more easy and complete as the temperature of the bath is more elevated.

In our opinion the facts are altogether different. In effect, the refining of a carburized alloy is produced not only by a superficial reaction between the metal and the fused slag in contact therewith, but also and perhaps in larger measure by an intermolecular reaction between the combined carbon and the oxide dissolved in the metal.

But all the metals of the iron family have the property of dissolving a certain proportion of their own oxide, and it is probable that the proportion of the oxide dissolved increases with the temperature. An elevation of the temperature of the bath to be decarburized increases therefore the proportion of the decarburizing agent, but it is not proved that it sensibly increases the immediate decarburizing action. In fact, it seems that at high temperature there exists a chemical equilibrium between the carbon and the dissolved oxide of which the reciprocal reaction should increase upon cooling, and should reach a maximum at a temperature slightly above the point of solidification of the metal.

It is well known that when fused carburized ferrochrome is superheated in the presence of an oxidizing slag, and that when the entire mass is allowed to cool it is regularly found that the surface of the previously tranquil bath becomes on cooling down the seat of a boiling movement at first slight, but increasing in intensity up to the moment immediately preceding solidification. It is likely that this ebullition is caused by the disengagement of oxide of carbon due to deoxidation of the dissolved oxide by the carbon presence in the alloy.

It is naturally very difficult to account for these circumstances and the exact cause of the phenomenon, because in any of the observed cases neither the variations of heat of formation of the metallic carbide nor of the oxide present are known; nor are the variations of the specific heats of the components and their products within the temperature ranges considered known exactly. One has the feeling, however, that this is an example of the principle advanced by Le Chatelier, that an increase of temperature favors endothermic reactions and a lowering of temperature exothermic reactions.

America's Heavy Fire Loss.

At the forty-third annual meeting of the National Board of Fire Underwriters, held in New York City May 13, President J. Montgomery Hare made an address, in which he stated that a comparison with statistics of losses in foreign countries shows that the loss per capita in the United States is from 10 to 30 times greater than in the principal European cities. For the last five years, he said, the annual fire loss in this country has averaged $269,200,412, the total for the period being $1,346,022,059, or about three-quarters of a million for each day of the five years. In this period the figures were largely increased by the San Francisco conflagration, but even taking the two years since then the losses have kept well above the $200,000,000 mark.

Without counting losses from forest fires, the destruction of property in 1907 by fire totaled $250,084,709, and in 1908, $217,885,850. The figures for this year give no promise of improvement, President Hare said, having reached a total of nearly $53,000,000 for the first three months.

* A paper read at the Niagara Falls meeting of the American Electrochemical Society.

The Tariff Bill in the Senate.

WASHINGTON, D. C., May 18, 1909.—The Senate resumed the consideration of the metal schedule on the 12th inst., taking up in order the paragraphs passed over in the first reading of the bill beginning with iron ore. During the interval subsequent to the first reading the members of the Finance Committee had made a careful canvass of the Senate to ascertain the character of the opposition to the metal schedule as reported, and several important concessions were decided upon. It was ascertained that a number of Senators from the Middle West were prepared to make a fight for lower duties on wire, especially the grades used for fencing, and it was decided to forestall this movement by revising these rates in a downward direction. Strong opposition to the Senate rate on structural steel was also discovered, and it was decided to restore the House rate of 3-10 cent per pound. Other minor changes have been made, but in the main the Finance Committee leaders have been able to carry through their original programme without important changes.

The Duty on Iron Ore.

The metal schedule was reached late in the afternoon of the 12th inst. The Senate amendment to paragraph 115½, transferring iron ore from the free to the dutiable list at 25 cents per ton, was read and was at once made the subject of protracted discussion. Senator Crawford of South Dakota, one of the new Republican members of the Senate, who has been classed with the so-called "progressives," stated that he would oppose a duty on iron ore or upon coal, lumber or petroleum, for the reason that he believed the natural resources of the country should be preserved as long as possible by the free importation of such products from other countries.

Senator Rayner of Maryland assailed the testimony of the iron and steel producers before the House Ways and Means Committee, declaring that "there seems to be something about the tariff that makes it impossible for a man interested in it to tell the truth—it seems to pervert the faculties of the human mind and the aspirations and longings of the soul for the truth." He added that in advocating free iron ore he spoke for "competitive interests that have a right to compete with the industries west of the Allegheny Mountains, and to be put on an equality with them; also for those who ultimately come into possession of the finished products, because when you lower the price of the raw material you necessarily lower to the ultimate consumer the price of the finished product."

Senator Oliver of Pennsylvania, who but recently entered the Senate, but whose practical experience in the steel industry has been such as to give considerable weight to his views, asserted that Cuban ores were worth at the port of shipment in Cuba an average of $3.65 per ton, and if imported at the rate proposed in the Senate bill, less the 20 per cent. concession under the existing reciprocity treaty with Cuba, could be laid down at the port of Baltimore at a less price than the cost of the lake ores to the owners of smelting furnaces in western Pennsylvania and eastern Ohio.

Senator Smith of Michigan defended the ore duty on the ground that it was necessary for the protection of the owners of the iron mines of the Superior region, who numbered many hundreds and who merely leased their property to the United States Steel Corporation.

After further discussion the vote was taken on the Senate amendment transferring iron ore from the free to the dutiable list at the rate of 25 cents per ton, which resulted in its adoption by 61 yeas to 24 nays.

On this ballot 18 Democratic Senators supported the Finance Committee amendment, while 14 Republicans cast their votes against it. The erroneous statement has been made in the daily press that the iron ore duty would have been lost but for Democratic votes, a statement predicated upon the fact that while there are 91 members of the Senate, only 43 Republican votes were cast for the duty. The fact is that six members of the Senate, including four Democrats and two Republicans, were absent, so that only 85 votes were cast, of which the 43 Republican ballots constituted a bare majority of one.

Pig Iron Paragraph Passed Over.

Paragraph 116, relating to pig iron, scrap iron and steel, &c., provoked considerable opposition from the insurgent Republicans, Senator Cummins of Iowa giving notice that he would offer an amendment reducing the rate on all kinds of scrap to 50 cents per ton. At the request of several Senators this paragraph was again passed over.

Paragragh 118, covering round iron in coils or rods, &c., agreed to on the first reading of the bill, was then reopened to enable Senator Cummins to offer an amendment reducing the duties 1-10 cent per pound.

Senator Aldrich expressed the opinion that the Finance Committee had probably cut too deeply into the Dingley rate in this paragraph, and that if any change should be made it ought to be upward instead of downward. Senator Lodge emphasized the fact that, in accepting the House rates on paragraphs of the metal schedule, the Finance Committee allowed no compensation whatever for the duty on iron ore, which it had imposed at the rate of 25 cents per ton, while the House had placed it on the free list. Senator Cummins' amendment was voted upon and defeated, yeas, 45; nays, 42.

Senator McLaurin of Mississippi then proposed to add at the end of paragraph 118 the following:

Notwithstanding anything in this bill contained, trace chains, log chains, lock chains, plows, plow stocks, plow handles, plow beams, colters, singletrees, doubletrees, clevises, clevis pins, lap rings, backbands, bellybands, hames, hame strings, bridles, halters, plow lines, hooks and cuffs for singletrees or doubletrees, axes, axe helves, hoes, hoe helves, hatchets, hatchet helves, hammers, hammer handles, horseshoes, horseshoe nails, spades, shovels, saws, squares, rakes, nails, tacks, staples, other kinds or character of farming implements or tools, and all carpenters' tools and blacksmiths' tools, when imported into this country, shall be exempt from the payment of a duty.

Senator McLaurin made an appeal to the Senate to aid the farmers of the country by giving them cheap implements and tools, but the Senate rejected the amendment, yeas, 22; nays, 52.

Cut in Rate on Structural Steel.

Paragraph 119, relating to structural steel, passed over in the first reading of the bill, afforded Senator Aldrich an opportunity to make a concession to the insurgents, which he did by moving to recede from the Senate amendment, increasing the rate of duty from 3-10 to 4-10 cent per pound and to accept the House rate. He adhered, however, to the Senate amendment placing all structural steel "assembled or manufactured or advanced beyond hammering, rolling or casting," in the basket clause of the metal schedule at 45 per cent. ad valorem.

Senator Newlands of Nevada opposed this provision, asserting that the reason for the large importations of structural steel was that the price demanded by the domestic producer was so unreasonably high as to encourage competition, and suggested that "the best way of preventing the foreign importations of this perfected structural steel is to lower the price of the domestic steel." Senator Cummins also attacked this paragraph and made it the text for a general assault on the metal schedule, declaring the rates to be unquestionably too high, as demonstrated by the exports of nearly $7,000,000 worth of steel products in 1907. Paragraph 119 was thereupon adopted, as follows:

119. Beams, girders, joists, angles, channels, car-truck channels, T T, columns and posts or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all other structural shapes of iron or steel, but not assembled, or manufactured, or advanced beyond hammering, rolling, or casting, three-tenths of 1 cent per pound.

Paragraphs 120 and 122, being the next passed over on the first reading, were then agreed to, as follows:

120. Boiler or other plate iron or steel, except crucible plate steel, and saw plates hereinafter provided for in this section, not thinner than No. 10 wire gauge, cut or sheared to shape or otherwise, or unsheared, and skelp iron or steel sheared or rolled in grooves, valued at 1 cent per pound or less, three-tenths of 1 cent per pound; valued above 1 cent and not above 2 cents per pound, four-tenths of 1 cent per pound; valued above 2 cents and not above 4 cents per pound, seven-tenths of 1 cent per pound; valued at over 4 cents per pound, 20 per centum ad

valorem: Provided, That all sheets or plates of iron or steel thinner than No. 10 wire gauge shall pay duty as iron or steel sheets.

122. Hoop, band, or scroll iron or steel, not otherwise provided for in this section, valued at 3 cents per pound or less, 8 in. or less in width, and less than three-eighths of one inch thick and not thinner than No. 10 wire gauge, three-tenths of 1 cent per pound; thinner than No. 10 wire gauge and not thinner than No. 20 wire gauge, four-tenths of 1 cent per pound; thinner than No. 20 wire gauge, six-tenths of 1 cent per pound: Provided, That barrel hoops of iron or steel, and hoop or band iron or hoop or band steel flared, splayed or punched, with or without buckles or fastenings, shall pay one-tenth of 1 cent per pound more duty than that imposed on the hoop or band iron or steel from which they are made.

Paragraph 123 was again passed over at the suggestion of Senators Culberson of Texas and McLaurin of Mississippi.

Steel Rails and Tin Plate Rates Adopted.

Paragraphs 124 and 125 were agreed to, as follows:

124. Railway bars, made of iron or steel, and railway bars made in part of steel T rails and punched iron or steel flat rails, seven-fortieths of 1 cent per pound; railway fish plates or splice bars, made of iron or steel, two-tenths of 1 cent per pound.

125. Sheets of iron or steel, common or black, of whatever dimensions, and skelp iron or steel, valued at 3 cents per pound or less, thinner than No. 10 and not thinner than No. 20 wire gauge, five-tenths of 1 cent per pound; thinner than No. 20 wire gauge and not thinner than No. 25 wire gauge, six-tenths of 1 cent per pound; thinner than No. 25 wire gauge and not thinner than No. 32 wire gauge, eight-tenths of 1 cent per pound; thinner than No. 32 wire gauge, nine-tenths of 1 cent per pound; corrugated or crimped, eight-tenths of 1 cent per pound; all of the foregoing valued at more than 3 cents per pound, 30 per centum ad valorem: Provided, That all sheets or plates of common or black iron or steel not thinner than No. 10 wire gauge shall pay duty as plate iron or plate steel.

Paragraph 128, covering tin plate, in which the Senate committee made no change in the House rates, but which had been reopened during the first reading of the bill, was then agreed to without change.

The next paragraph passed over on the first reading was paragraph 133, which was then agreed to, as follows:

133. Wire rods: rivet, screw, fence and other iron or steel wire rods, whether round, oval, flat, or square, or in any other shape, and nail rods, in coils or otherwise, valued at 4 cents or less per pound, three-tenths of 1 cent per pound; valued over 4 cents per pound, six-tenths of 1 cent per pound: Provided, That all round iron or steel rods smaller than No. 6 wire gauge shall be classed and dutiable as wire: Provided further, That all iron or steel wire rods which have been tempered or treated in any manner or partly manufactured shall pay an additional duty of one-half of 1 cent per pound.

Finance Committee Reduces Rates on Wire.

No item of the metal schedule has aroused more opposition than paragraph 134 covering round iron or steel wire of various gauges, including fence wire and other grades largely used in the farming community. Early in the consideration of the metal schedule Chairman Aldrich decided that the Finance Committee's rates, although in some cases lower than those of the House bill, were too high, and when this paragraph was reached on the second reading of the bill he offered a substitute embracing material changes in phraseology and reductions in rates which was adopted, as follows:

134. Round iron or steel wire, not smaller than No. 13 wire gauge, 1 cent per pound; smaller than No. 13 and not smaller than No. 16 wire gauge, 1¼ cents per pound; smaller than No. 16 wire gauge, 1¾ cents per pound: Provided, That all the foregoing shall pay duty at not less than 35 per centum ad valorem; all wire composed of iron, steel, or other metal except gold or silver, covered with cotton, silk, or other material, corset clasps, corset steel, dress shields, and all flat wires, and steel in strips, twenty-five one-thousandths of 1 in. thick, or thinner, made from wire or tempered steel wire rods, whether in long or short lengths, in coils or otherwise, and whether rolled or drawn through dies or rolls, or otherwise produced, and all wire not specially provided for in this section, shall pay a duty of not less than 40 per centum ad valorem; on iron or steel wire coated by dipping, galvanizing or similar process with zinc, tin, or other metal, there shall be paid two-tenths of 1 cent per pound in addition to the rate imposed on the wire of which it is made: Provided further, That articles manufactured wholly or in chief value of any wire or wires provided for in this paragraph shall pay the maximum rate of duty imposed in this section upon any wire used in the manufacture of such articles and in addition thereto 1 cent per pound: And provided further, That no article made from or composed of wire shall pay a less rate of duty than 40 per centum ad valorem; telegraph, telephone, and other wires and cables composed of metal and rubber, or of metal, rubber and other materials, 45 per centum ad valorem; barb fence wire, three-fourths of 1 cent per pound, but the same shall not be subject to any additional or other rate of duty hereinbefore provided.

Paragraph 140, covering automobiles, bicycles, &c., passed over on the first reading of the bill, was again put over for further consideration.

Paragraph 150, passed over on the first reading, was agreed to, as follows:

150. Lap-welded, butt-welded, seamed, or jointed iron or steel tubes, pipes, flues, or stays, not thinner than No. 16 wire gauge, if not less than three-eighths of an inch in diameter, 1 cent per pound; if less than three-eighths of an inch and not less than one-fourth of an inch in diameter, 1¾ cents per pound; if less than one-fourth of an inch in diameter, 2 cents per pound; cylindrical or tubular tanks or vessels, for holding gas, liquids, or other material, whether full or empty, 30 per centum ad valorem; flexible metal tubing or hose, not specially provided for in this section, whether covered with wire or other material, or otherwise, including any appliances or attachments affixed thereto, 30 per centum ad valorem; welded cylindrical furnaces, tubes or flues made from plate metal, and corrugated, ribbed, or otherwise reinforced against collapsing pressure, 2 cents per pound; all other iron or steel tubes, finished, not specially provided for in this section, 30 per centum ad valorem.

The Senate then took up paragraph 151, relating to cutlery, which provoked an extended debate in which many things not contained in the metal schedule were discussed at length. The duty on razors, which the Senate increased materially over the House rates, was assailed by several minority Senators, including Senators Stone of Missouri and Simmons of North Carolina. Senator Bailey, on behalf of the minority, protested against the proposed increase in the rate on razors, declaring that it was proposed to charge the people of the United States over $176,000 more for their razors than they now pay, although the entire expenditure for wages in the razor-making industry is only $126,000. The people could well afford to pay the $126,000 and let the razor makers do nothing, as they could save $50,000 by the operation.

Senator Aldrich presented a few verbal amendments to the paragraphs of the cutlery schedule which were thereupon adopted.

Paragraph 157, relating to enameled iron and steel wares, was then reopened and a substitute therefor adopted, as follows:

157. Table, kitchen and hospital utensils, or other similar hollow-ware of iron or steel enameled or glazed with vitreous glasses but not ornamented or decorated with lithographing or printing, 40 per centum ad valorem.

Higher Duties on Antimony.

Paragraph 171 was the subject of considerable debate. The duty on antimony provided by it was increased by the Finance Committee from the House rate of three-fourths cent per pound to 1½ cents, and antimony ore was taken from the free list and made dutiable at 1 cent per pound on the metallic content thereof. These changes aroused the opposition of the insurgent Republicans, who were disposed to further antagonize an additional amendment reported by Senator Aldrich placing a duty on 1½ cents per pound and 25 per centum ad valorem on oxide of antimony. The duties were urged vigorously, however, on the ground that there were large deposits of antimony in this country, few, if any, of which could be operated under existing conditions, and that the federal Government must rely for the supply of antimony required in the manufacture of fixed ammunition for the equipment of its military forces upon an English monopoly which controlled the markets of the world. The paragraph was finally adopted, in part, as follows:

171. Antimony, as regulus or metal, 1½ cents per pound; antimony ore, stibnite and matte containing antimony, 1 cent per pound on the antimony contents therein contained; . . . antimony, oxide of, 1½ cents per pound and 25 per centum ad valorem.

Dingley Rates Retained on Lead Products.

Paragraphs 179, lead in ore, and 180, lead bullion, pig lead, &c., were debated at much length, and at one time it seemed probable that the Republican insurgents would succeed in forcing down the compensatory rates on pig and bullion, although the entire lead schedule was made up on the basis of the Dingley rates. The House adopted the Dingley rate on lead ore, but placed pig and bullion in the same bracket, contending that no differential was necessary. After an animated discussion, however, the Senate adopted the two paragraphs as reported by the Finance Committee.

A spirited debate was provoked by the Finance Committee's amendment to paragraph 189, watch movements, &c., which struck out the entire House provision and substituted higher rates and more stringent requirements regarding marking. Senator Lodge, on behalf of the committee, stated that a small concession would be made in the rates on dials for watches by the substitution of a duty of 3 cents per dial and 40 per cent. ad valorem for the original committee rate of 60 per cent. ad valorem. With this and minor verbal amendments the insurgents were forced to be content.

Notice was then given by Senator Smoot, on behalf of the Finance Committee, that the rates on zinc in ore and spelter as reported by the committee would be withdrawn and a graduated scale based on valuations substituted therefore, but that the Senate would be given time to examine the amendment carefully before voting upon it.

Senator Aldrich gave notice that before proceeding with Schedule D, lumber, &c., which follows the metal schedule, he would ask the Senate to return to Schedule A and to act upon all the paragraphs of the first three schedules passed over on the second meeting. It is probable, therefore, that the paragraphs of the metal schedule not yet adopted will be reached during the coming week.

W. L. C.

Canadian Industrial Notes.

TORONTO, May 15, 1909.—The Temiskaming & Northern Ontario Railway Commission has placed an order with the Algoma Steel Company for 2000 tons of 80-lb. rails for relaying and siding purposes. This railroad, it is perhaps needless to say, belongs to the Ontario Government, by whose commission it is managed. An order for two passenger and four freight engines has been placed by the commission with the Canadian Locomotive Company, Kingston. Two switching engines are being built for the commission, and a contract for seven conductors' vans has been given to the Silliker Car Company, Halifax.

An additional blast furnace and another open hearth steel furnace are to be added very shortly to the producing capacity of the Algoma Steel Company.

An order for 5000 tons of 85-lb. rails was recently received by the Dominion Iron & Steel Company from the Great Northern Railway Company of England. The rails are to be of the bullhead type.

Work is to be renewed at once at the mines of the Atikokan Iron Company. The operation of the mines has been suspended for about a year and a half.

It is estimated that $85,000,000 will be expended this year on the construction of railroads in the Canadian West. The extension projects are those of the Canadian Pacific, the Canadian Northern, the Grand Trunk Pacific and the Hill system, along with those of some lesser companies.

The last order for steel rails for the Pacific section of the Grand Trunk Pacific was forwarded by vessel from Sydney, N. S., to Vera Cruz, in Mexico. Thence they went by rail to point of vessel shipment on the Pacific Coast, where they were loaded for Prince Rupert.

It is reported from Hamilton, Ont., that the Hardware Supply Company, Grand Rapids, Mich., has decided to establish a branch there.

C. A. C. J.

The Standard Oil Company has completed all the pumping stations and pipe lines necessary to pump crude oil in large quantities from the Kansas and Oklahoma oil fields to the Atlantic seaboard, a distance of 1500 miles. It is stated that some of the company's tanks near Elizabeth, N. J., are now holding oil which has been piped this tremendous distance. It is refined at the seaboard.

The Crucible Steel Company of America has sold to the Pennsylvania Railroad Company the property at Sixteenth and Railroad streets, Pittsburgh, formerly occupied by the Howe-Brown Works. The reported price paid for the property is $1,000,000.

The American Foundrymen's Association.

CINCINNATI, OHIO, May 18, 1909.—(*By Telegraph.*)—The close of the first day of the fourteenth annual convention of the American Foundrymen's Association shows a registration of 1200 members and guests of the association and the three allied organizations. The weather has been ideal, and in most respects the gathering now promises to be highly successful. While it covers less floor space than that at Toronto last year, the exhibit of foundry appliances and machinery brought together by the Foundry and Manufacturers' Supply Association, under the direction of Secretary C. E. Hoyt, is fully as representative, and hundreds of proprietors, superintendents and foremen are here to find out about the new things of the year. One drawback to the sessions for the reading of papers is that the meeting room on the second floor of Music Hall is not far enough removed from the exposition to prevent interruption from the noise of foundry machinery.

The opening meeting, which was a joint session of the American Foundrymen's Association and the American Brass Founders' Association, was called to order this afternoon by the president of the former, L. L. Anthes, Toronto Foundry Company, Toronto, Canada, who read the annual presidential address. He emphasized the desirability of establishing a foundry laboratory under the auspices of the association. The National Founders' Association, to which the matter had been presented at its New York meeting last November, had appointed a committee to co-operate, but owing to the condition of business the plan had not been carried out. A line of progress on which the speaker believed much could be done is the provision of facilities, through continuous pouring and the provision of conveyors for molds, to work molding machines to their full capacity.

W. R. Webster, Bridgeport, Conn., vice-president of the Brass Founders' Association, presented the annual address of that organization in the absence, through illness, of President C. J. Coley. He dwelt on the benefits of association effort to those working in the nonferrous metals, particularly suggesting the establishment of standards for brass analysis. Secretary W. M. Corse reported the present membership of the Brass Founders' Association to be 206, a net gain of 61 in the year. The receipts were $1042 and the balance on hand is $148. Mr. Corse reported that representatives of the Government Bureau of Standards and of the American Chemical Society were present to co-operate with any committee that might be appointed on standard methods of analysis for brass and kindred alloys.

Report of the Secretary-Treasurer.

Dr. Richard Moldenke presented his report as secretary and treasurer as follows:

It is but natural that the period of depression through which the foundry industry is passing should in a great measure be reflected in a statement of the condition and activity of the association. Yet in spite of the difficult collections and the great number of members not in good standing at the present time, interest in the work of our association is on the increase, and the information disseminated is no longer falling on so much barren ground as formerly. The enormous attendance at our conventions, stimulated without doubt by the magnificent working exhibitions—a tribute to the educational tendencies of the day—is bringing about an interchange of thought on desirable lines of foundry progress, the outcome of which we see reflected in our convention programme. Probably two lines of foundry economy have been more or less studied during the last year. They are the permanent mold, with the elimination of waste where success has obtained, and continuous melting, with the resulting increase in output of existing plant units.

PERMANENT MOLDS AND CONTINUOUS MELTING.

The correspondence passing through the secretary's office has reflected the above mentioned tendencies rather sharply, and would seem to indicate that before long we will find foundrymen understanding their cupolas better and manipulating them to suit their floor conditions, instead of *vice versa*. The permanent mold will probably still further specialize in the foundry, gradually drawing from the general trade certain castings which have to be made very cheap and in quantity. Separate plants of comparatively

small size, but enormous capacity, fully equipped to do just one line of work, turning scrap into finished castings of uniform composition and specified service requirements, will be located where the proper commercial conditions obtain, and another chapter will be added to the growing volume on modern foundry practice.

MEMBERSHIP.

Deducting from our membership list those whose case may be termed hopeless, we have to-day 724 firms and individuals enrolled, the majority of whom we have been able to serve during the year with foundry information of one kind or another, in addition to the regular channel of our *Transactions*. The pleasant, though onerous work thus entailed has naturally militated strongly against giving proper attention to reviewing the technical press for the benefit of all our membership, as well as the conduct of the research work outlined last year. The value, however, to those whom we have thus assisted evidently prompted many, in sending their votes for increased dues, to remark that the money thus spent was their best paying investment.

Agreeable to the resolution passed by the Toronto convention, ballots were sent out recently asking for a vote on the proposed increase in annual dues to $10. The purpose was fully explained in an accompanying circular. The ballot showed 143 votes in favor and 44 against. The affirmative being less than the required two-thirds vote of the entire body, the proposition failed of acceptance. While this is much to be regretted, evidently the hard times are to blame. Of the affirmative votes there were but few in which there was not added some commendatory remark, thus encouraging your executive board greatly and giving valuable suggestions. One point seemed to stand out specially—a desire to have a bound volume of the *Transactions* at the end of each year, as is the custom of the great engineering societies. Were our finances ample, this would be a very fine thing to do.

RESEARCH AND COMMITTEE WORK.

The research work inaugurated by the association has been continued. Apparatus has been purchased and it is expected that most of this will be returned, so that the fund may benefit thereby when the object has been attained. Much apparatus has also been made in connection with the molding sand tests, and some melting tests with briquetted coke dust, with a view of desulphurization, have been made, though this is not sufficiently advanced for a report. A large amount of work has been done on the molding sands, of which an admirable collection was made. The balance left in the fund to date is $433.39, expenditures having only been made for apparatus, hired labor and small incidentals. The fund should last several years yet, and interesting and useful results should be obtained.

Our Committee on the Prevention of Accidents in Foundries had a very busy time for a few months, and got up a remarkable series of statistics, calls for copies of which have come from everywhere. Our Committee on Industrial Education has quietly but none the less effectively spread information on this important subject, and here also there have been many calls for literature and special investigations.

Our relation with our sister associations has been most cordial. The executive boards have met jointly during the year to consider the problems arising out of the exhibit feature, now part of the conventions. We have taken the broadest possible stand in these matters, believing that anything of educational value to the industry as an entirety should be encouraged as much as possible and made to be of direct benefit to us as well. Herein we differ very much from foreign practice, one great association of an industrial nature allowing no exhibits whatever, and even locking the doors during the sessions.

FINANCIAL STATEMENT.

The financial report for the year is as follows:

RECEIPTS.

Income from dues and subscriptions to *Transactions*		$2,635.15
Balance from last year		37.74
Total		$2,672.89

EXPENDITURES.

Transactions	$765.60	
Printing	209.38	
Salaries	900.00	
Postage	432.00	
Accident Committee	215.61	
Toronto convention	142.36	
		2,664.95
Balance		$7.94

A glance at the items of expenditure and comparison with previous reports will show the change that has come in the operation of the association's affairs. By joint resolution of the executive boards of the American Brass Founders' Association and our own, an interchange of *Transactions* has taken place, and thus membership in one association gives the advantages of both. This necessarily has increased the size of the edition printed, as well as the postal expenditure. The printing account has also increased, as our membership is larger, and great efforts were made to obtain new members as well as hold the old ones. The convention expense has now become quite heavy, as formerly many petty expenses were provided for by the local committee of entertainment, this consisting of foundrymen, who were glad to help along the cause. Now this is borne by the association.

It is to be hoped, therefore, so long as the association will not grant a larger income, that our membership will increase sufficiently to enable us to do more. There should not be a large balance at the end of a fiscal year, for any expected surplus should be promptly placed into publication or research work. It were better, however, that we need not sail quite so close to the wind. May the hard times, therefore, soon pass, so that with the interest everywhere manifested we may grow larger and stronger and our industry benefit correspondingly.

Thomas D. West presented the report of the Committee on Foundry Accidents which represented a vast amount of labor in gathering data. The meeting adjourned after a paper on "Disability Insurance for Employees," read by L. O. Chatfield, Detroit, Mich., president of an accident insurance company.

J. S. Seaman, Pittsburgh, was appointed chairman of the Nominating Committee. It is practically decided that next year's convention will go to Detroit and that of 1911 to Pittsburgh.

Labor Notes.

The Amalgamated Association of Iron, Steel and Tin Workers, which has been holding its annual convention at Detroit since May 4, has adjourned, after choosing Fort Wayne, Ind., for next year's convention and re-electing the following officers: President, P. J. McArdle, Pittsburgh; secretary-treasurer, John Williams, Pittsburgh; assistant secretary, M. F. Tighe, Pittsburgh; managing editor of the *Amalgamated Journal*, Ben I. Davis, Pittsburgh; trustees, C. J. Monahan, Pittsburgh; Joseph Grandidier, New Albany, Ind., and David J. Davis, New Castle, Pa. The vice-presidents were reduced from five to two, B. F. Jones, Pittsburgh, being chosen vice-president for the boiling and finishing division, and Llewellyn Lewis, Martins Ferry, Ohio, for the sheet and tin division.

The new wage scale which the Sons of Vulcan adopted at its recent convention shows a slight advance in rates for puddling over those now in force. The base price asked is $5.25 per ton for boiling on a 1-cent card, and this remains effective until the selling price of bar iron reaches 1.30 cents, when the rate is to be increased to $5.50 per ton. The present rate is $5 on a 1-cent card, increasing to $5.12½ when bar iron sells at 1.25 cents. An increase is asked in the busheling rate from $2.28 to $2.32 for busheling heavy scrap on a cinder bottom and from $1.95 to $2 for the same work on a sand bottom. For muck rollers the 1907 scale, or one-seventh the boiling rate, is asked.

Effective May 1, salaries of all employees of the Sharon Steel Hoop Company, Sharon, Pa., were reduced an average of 10 per cent.

The Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, has established agencies in Canada for the sale of its products in the territory west of Lake Superior with the Brydges Engineering & Supply Company, 249 Notre Dame avenue, Winnipeg, and with Mussens, Ltd., 299 St. James street, Montreal, Canada, for the sale of its staybolt material in the territory east of Lake Superior. The company has appointed H. J. Skelton & Co., Royal London House, Finsbury Square, London, E. C., England, as its representative for the British Isles and India.

The scheme of a customs court of appeals proposed by the Senate Finance Committee in its amendment to the Customs Administration act is meeting with strong opposition. Judges of United States courts are of the opinion that an additional court is unnecessary, while customs attorneys express the view that a specialized court would be prejudicial to the interests of their clients. The opposition is by no means confined to these interests, but also comes from importing merchants.

THE IRON AGE

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The Lake Superior Ore Movement.

Stocks of iron ore on dock at Lake Erie ports amounted to 5,400,000 tons May 1, the date taken for statistical purposes as the opening of navigation, while on May 1, 1908, they were about 5,500,000 tons. The inference might be that the consumption of lake ores in the districts receiving such ores through Lake Erie ports was practically equal, in the 12 months ending May 1, to the amount of such ore brought down to Lake Erie last year. But the really important factor in the account is an unknown one—the stocks of ore carried in furnace yards. Are these greater or less than at the opening of navigation in 1908? By general report, such stocks amount to more than the ore on dock at Lake Erie ports, so that it is not unreasonable to put the present available supply of lake ores for the furnaces of Ohio, Pennsylvania, New York, New Jersey and West Virginia at 12,000,000 to 13,000,000 tons.

The question whether the consumption of lake ores in the districts tributary to Lake Erie, for the 12 months preceding May 1, was greater or less than the tonnage of ores brought to Lake Erie last year, is of interest as bearing on the probable shipments of ore from Lake Superior in 1909. Exact data for an answer to this question are not at hand, but some light can be thrown upon it by a calculation. The shipments to Lake Erie ports last year were 20,414,000 tons, or 58 per cent. of those in the preceding year. The production of pig iron in Ohio, Pennsylvania, New York, New Jersey and West Virginia (leaving out the relatively small amounts made in Maryland and Kentucky from lake ores) was 11,158,934 gross tons, or 59 per cent. of the amount produced in these States in 1907. Reckoning an average of 1.8 tons of Lake Superior ore to a ton of pig iron would give an ore consumption in the above States in the calendar year 1908 of 20,086,081 tons. The amount of local ores and of imported ores supplied to the furnaces of these States was close to 3,750,000 tons in 1907. It may be put at, say, 60 per cent. of this amount for 1908, or about 2,250,000 tons. This added to 20,414,000 tons of ores received at Lake Erie ports gives a total of 22,664,000 tons of iron ore available for the furnaces referred to in 1908, or 2,578,000 more than they consumed in that year.

But our reckoning is with the year ending April 30, 1909, which represents a considerable increase over the rate of pig iron production in the calendar year 1908. In the first four months of 1909 the blast furnaces in the five States mentioned produced 5,111,854 tons of coke and anthracite iron, according to the monthly statistics of *The Iron Age*. This would be at the rate of about 15,540,000 tons a year, or 39 per cent. more than the 1908 rate. It would appear, therefore, that the 2,578,000 tons of ore shipped in 1908 over and above the needs of these furnaces has been consumed in the first four months of 1909. And since the ore consumption of these same furnaces in the eight months following May 1, 1908, was at a greater rate than their average rate for the year 1908, it is evident that stocks of ore in furnace yards were somewhat smaller on May 1, 1909, than on the same date in 1908.

It may be said roundly that pig iron production in districts supplied with Lake Superior ores is now at a rate 40 per cent. greater than in 1908. If that rate is maintained in the next 12 months, and if it be assumed that the Lake Superior shipments last year were properly adjusted to the demands of the year, as they seem to have been, the shipments for 1909 may be expected to be in the neighborhood of 36,000,000 tons, as against 26,014,987 tons last year. Such an estimate presupposes that furnacemen and ore sellers will not attempt to reduce greatly the present reserve in furnace yards and on Lake Erie docks, or that in case this is done by some interests there will be others who will ship in excess of requirements, on the belief that a higher price for lake ores will rule in 1910. An ore movement of 36,000,000 tons this year would still fall considerably short of the record of 42,266,668 tons in 1907.

The Hewitt Pig Iron Prophecy.

We have been requested to reprint what has now become the famous prophecy made by the late Hon. Abram S. Hewitt of the rate of increase in the annual production of pig iron. This prophecy was first made in 1856, but it was amplified by Mr. Hewitt in 1872, when he delivered the address of welcome at the meeting of the American Institute of Mining Engineers in New York City in May of that year. The portion of this latter address which refers to the rate of increase in the production of pig iron is as follows:

In 1856 I had occasion to trace the history of the manufacture of iron, and established what may be termed its law of development, rather rude, indeed, but plainly dependent upon the growth of population and the spread of civilization throughout the world.

At that time the annual production of iron had reached about 7,000,000 tons, of which Great Britain produced 3,500,000 tons and the United States about 1,000,000 tons. The consumption of Great Britain was 144 pounds, and of the United States 84 pounds, while the average consumption of the world was only 17 pounds, per head of population. It was shown that the consumption per head was steadily on the increase, and that, consequently, the annual production was being enlarged so rapidly as to double once in 14 years; and it was predicted, after making due allowances for all drawbacks, such as the wars which have, unhappily, taken place in the interval beyond any possible expectation, that in 1875 the production of iron would surely reach 14,000,000 tons. The actual returns show that in 1871 the production amounted to 13,500,000 tons, and in 1872 the limit, 14,000,000, will undoubtedly be passed, so that the estimate made in 1856 is more than realized. Meanwhile, the consumption has risen in England to 200 pounds, in the United States to 150 pounds, and in the whole world to 30 pounds, per head.

It is not possible to convey a more striking idea of the progress of the world during the last 17 years than this statement affords. The consumption of iron measures the progress of civilization, and it is impossible not to believe that the whole world will ultimately require as much iron per head as we now use in the United States, when a total annual production of over 70,000,000 tons will be required. But, if these figures seem to be at all wild, no one can for a moment doubt that the next 17 years will double the present annual production of iron, bringing it up to 28,000,000

tons per annum; and I feel quite safe in asserting that the beginning of the twentieth century, which some among you may hope to see, will witness an annual production of over 40,000,000 tons.

You need not be told that iron is produced at less money cost in Great Britain than in any other quarter of the globe. This has enabled her to produce about one-half of the total annual make. Of the 7,000,000 tons made in 1855, Great Britain produced 3,585,906 tons, and of the 13,500,000 tons produced last year, she turned out nearly 7,000,000 tons. It is evident, however, that there are limits in the way of raw material and labor beyond which Great Britain cannot go. While I see no reason to doubt that there will be a steady increase in production, it is evident that she will not be able to supply hereafter, as heretofore, so much as half the annual wants of the world of iron. But, allowing this proportion to Great Britain, there will still remain 14,000,000 tons to be made by the rest of the world. The history of the trade, as well as the natural resources of the several nationalities, prove that the bulk of this additional product can only be made in the United States.

We are, in fact, the only people who have kept pace with Great Britain in the ratio of increase. In 1855, when Great Britain produced 3,500,000 tons, we produced 1,000,000 tons. In 1872, when Great Britain will produce 7,000,000 tons, we will produce 2,000,000 tons—the quantity produced in Great Britain in 1847—showing that we are only 25 years in arrear of her magnificent production. At the same rate, therefore, we would make 7,000,000 tons in 1897. But as Great Britain cannot possibly maintain her rate of increase, there does not seem room for a doubt that our annual production will reach at least 10,000,000, and will, probably, amount to 15,000,000 tons before the close of the present century.

It will be observed from the above that Mr. Hewitt's 1856 forecast was fully verified. When his address of 1872 was published no little skepticism was expressed in iron trade circles as to the huge output which he foretold would be reached by the end of the nineteenth century. Wild as his figures then seemed to be, they were, however, wonderfully close to the actual production realized. His expectation that by 1890 the world's production of iron would be 28,000,000 tons per annum was 1,000,000 tons above the figures which are accepted as the output of that year, but his estimate that the beginning of the twentieth century would witness an annual production of over 40,000,000 tons proved correct, as the world then made 40,200,000 tons.

The comparison he made with Great Britain shows that so far as that country and the United States are concerned his expectations were strictly in the proper direction. He forecasted a production by this country of at least 7,000,000 tons in 1897, while our output in that year was actually 9,652,680 tons. He thought that our annual production would probably amount to 15,000,000 tons before the close of the century, but this was not quite reached, as the output in 1899, a record year, was a little under 14,000,000 tons, and in 1900 was still short of those figures. It was not until 1901 that an output of 15,000,000 tons was attained.

The remarkable fact about this forecast is that Mr. Hewitt made it at a time when this country was by no means a prominent producer of pig iron. In the 70's our production hovered around 2,000,000 tons a year, some years running above and other years below those figures, and it was not until the latter 80's that the annual output of the United States ran over 5,000,000 tons. The first year in which such a production was attained was 1886, when this country made 5,683,329 tons. To look so far ahead, and to see so plainly that the United States would outstrip Great Britain required not only supreme confidence in the existence of sufficient resources in raw material to justify such an enormous increase, but also great sagacity in foreseeing that such a result was predestined.

Mr. Hewitt's complete omission of Germany as a factor in contributing to the great expected increase in the world's production of pig iron is noteworthy. At the time this address was made, in 1872, Germany appeared to be a somewhat insignificant producer of pig iron, yet its annual production was then within 600,000 tons of that of the United States. It has since advanced very gradually but continuously year by year until in 1901 it was abreast of Great Britain, and in 1903 it outstripped that country to the extent of 1,100,000 tons. Its production is now about 33 1-3 per cent. in excess of that of Great Britain, and if Mr. Hewitt were living to-day, instead of making comparisons with the production of Great Britain, he would be obliged to consider Germany in this respect.

Fireproof Factories for the Country.

The fireproof manufacturing building in localities without fire fighting facilities is still a rarity. Mill construction has the preference, and wooden factories are often erected to house valuable equipment and manufactured products and the materials from which they are made. In populous centers the fireproof industrial building is gaining in favor. The risk of conflagration is greater than in a small town, but, on the other hand, there is usually adequate protection, both in the way of apparatus and water supply. The insurance rate is less in the city, from which it may be deduced that the risk is greater in the country and the need of fireproof buildings correspondingly important.

Probably there is insufficient general knowledge of the rapid strides that have been made in the development of the several elements entering into fireproof construction by which its cost has been lessened. As compared with the slow burning type, the cost to-day is only about 10 per cent. more for a building in which the hazard of fire may be considered negligible under ordinary circumstances, especially in neighborhoods where there is no risk from outside. In exceptional cases, where the contents are of an especially inflammable nature, the argument may not hold, but such instances include few machine shops or factories in the metal industries. While the initial investment is somewhat greater, against this is the offset of a decreased insurance rate, which materially reduces the additional annual interest on the investment. In a recent case a canning factory located on Cape Cod, outside of a zone of fire protection, was built on fireproof principles and equipped with a complete sprinkler system, and the result was a decrease in the insurance rate from $2.25 to 75 cents. In mill construction where oil is freely used in manufacturing, as is the case in many metal industries, the risk of serious fire increases with the passage of time, the saturated woodwork becoming more and more inflammable with the drying influence of age.

Hardly less important than the destruction of property, in considering the danger of loss by fire, is the factor of risk which cannot be covered in a policy. When a shop is burned with complete loss the insurance companies make good the property destruction. But they cannot make compensation for the loss of business and the inability to fill orders or to accept them; the destruction of patterns and drawings; and the handicap which this all means in keeping a footing in the trade. The investment of an additional 10 per cent. on buildings, less the saving in insurance premiums and possibly in cost of maintenance, is a small matter as compared with immunity from crippling loss. A great deal of industrial building is contemplated which will materialize this year and next. The men upon whom the responsibility rests might do well to investigate thoroughly the

subject as it is now presented by those who contribute to the improved construction.

CORRESPONDENCE.

The Isolated Power Plant.

To the Editor: The replies published March 18 to my article upon the subject of isolated power plants in *The Iron Age* of February 18, warrant some comment by me. I have rarely had the good fortune to find in the arguments of these who differ from me such striking and serviceable illustrations for my own views as are presented in particular in the reply of Percival Robert Moses. Job himself would have been satisfied to have his adversary write such a reply or edit such a magazine as Mr. Moses' *Isolated Plant.*

Now, I reached in my article and still hold two conclusions which I regard as important: First, that no argument for an isolated plant is fair or wise which does not consider all the probable elements which enter into real cost. Second, that when consulting engineers discuss or act upon this subject they show an ever recurring bias. I do not mean that they would burn down a temple to be famous like the Greek in the legend. I disclaim again, as I have done from the start, any suggestion that they have an active and conscious corrupt motive in advising that they should receive commissions. But just as we who are lawyers are in truth more in favor of litigation than laymen, so consulting engineers are equally dangerous in the way in which they approve of the value of their own services.

Under the first head I am able to draw from the reply by Mr. Moses some astonishing examples of neglected items of cost. But let me first correct a serious error in arithmetic. Every sinking fund is measured by clear thinkers, not by its annual appropriation, but by the time within which it will create a sufficient sinking fund. My allowance of 5 per cent., to which Mr. Moses also commits himself, was for a 13½ year fund. By saying that "interest should be reduced each year as the investment is written off," he has abstracted from this fund for the benefit of "interest" the interest on the sinking fund. Either this is a grave arithmetical error or else he stretches the sinking fund period to 20 years without saying so frankly. Turning to costs themselves, I observe that he states the cost of the Security Mutual Life Building plant, without allowing 1 cent either for repairs or for profit. And he states the monthly operation cost of the Langdorf Building at the rate per year of $5400, comparing it with Central Station estimates of $7000, without any indication whatever that the figures which he gives allow or do not allow for rent, interest, depreciation, taxes, insurance, repairs or profit. To quote Mr. Moses, "these are the facts" about his alleged facts and no amount of theorizing can make up for such omissions.

Nor are these samples of omissions unfair or accidental. They are not only typical of the advocate of isolated plants, but they come from the typical advocate. Under all circumstances it is temperate in me to have said that the average owner had better not make such a man "judge of whether" he should have a commission." RICHARD W. HALE.

BOSTON, MASS.

REPLY TO THE ABOVE.

To the Editor: Mr. Hale states that he is satisfied with my reply and with the magazine I edit entitled *Isolated Plant.* As I remember my biblical history, Job was rather easily satisfied, and I judge that some of Mr. Hale's confreres regard the magazine more in the light of a plague; otherwise the publishers of this magazine would not receive a letter from one of their advertisers stating that because of threats by "interests antagonistic" to the publication they were obliged to cancel their contract for a year's advertising.

Now, as to Mr. Hale's conclusion. I still think that he did suggest that consulting engineers had an active and consciously corrupt motive in advising that they should receive larger commissions.

Mr. Hale makes a correction of what he terms a serious error in arithmetic. This is a practical question, to be determined by the practical business man. If he invests $1000 and at the end of the year saves out of the earnings $50 for interest on the $1000 he invested and $50 to repay the first cost, his investment at the beginning of the second year is certainly not $1000, but $950, and the interest is to be figured at the end of the second year on the $950 and not on the full amount of the original investment. Any other course would mean that at the end of the sinking fund period he would still be charging himself 5 per cent. on the original investment, although all the original investment had been repaid.

While on this subject of interest and depreciation, it seems proper to call attention to a phase that has been neglected. This was brought to my attention by Mr. Price of the De La Vergne Company, and it seems to me that his reasoning is entirely sound. He says: "If it is proper to figure the interest on the cost of the plant, why is it not proper to figure interest on the excess cost each year if a plant were not installed?" In other words, if the cost of producing electricity from the private plant—leaving out all fixed charges for the present—is $3000 less than the cost of purchasing it from the central service, should not interest be figured on this excess $3000 during the term of comparison? I think it should.

If the period of comparison be fixed at 15 years, and the excess cost at $3000 a year—*i. e.*, the difference between the cost of purchasing the current and the cost of manufacturing it—the interest on this excess cost would be over $6500. That is, there would be interest on $3000 for 14 years, interest on a second $3000 for 13 years, interest on a third $3000 for 12 years, &c. This item of interest on excess annual cost will usually be found to far outweigh the interest chargeable to the plant investment.

To return to Mr. Hale's letter; regarding the cost of the Security Mutual Life Building, he states that I have not allowed 1 cent either for repairs or for profit. As to repairs, I have shown all the costs as given me by the comptroller, and I have the figures for several years, and all repairs are included. As for the profits, I think I have clearly stated what the difference would be between the cost of operation and the cost of central service, and this is the profit less the fixed charges. In another part of my reply, I spoke about the fixed charges and as to what allowance should be made. I think any fair-minded reader, in reading over this article, would see that there was no attempt whatsoever made to hide the truth.

In the case of the Security Mutual and in the case of the Langsdorf Building, the actual conditions do not warrant any allowance for rent, taxes or insurance. The buildings were designed and built before the plants were designed, and space was allotted for the machinery without regard as to whether an electric plant was to be installed or not. In fact, in the case of the Langsdorf Building, the contract was practically signed with the New York Edison Company when the owners decided to investigate further and finally installed their own plant, and no additional space was taken up. No increase has been made in the taxes because of the installation of the plant, nor in insurance. These are the practical facts and there were no omissions. It is easy to figure that there should be insurance and that there should be taxes, but a practical man knows that unless the plant is a large proportion of the cost of the building there will be no increase because of the presence of the electric plant on the building.

NEW YORK CITY. PERCIVAL ROBERT MOSES.

The Duty on Ferroalloys.

To the Editor: In *The Iron Age* of May 6, there appeared a letter signed by "Foundryman," upon the subject of the proposed new duties on ferroalloys, which so entirely misstates the case that we ask the courtesy of your columns for reply.

The Dingley law, it is true, provided a duty of $4 a ton on ferrosilicon and ferromanganese, classing them with pig iron, but at that time 50 per cent. ferrosilicon was commercially unknown, and the commodity intended to be taxed was the blast furnace product containing 12 to 15 per cent. silicon. This is beyond dispute, since the United States customs returns show:

In 1897, 1,324.93 tons of ferrosilicon imported of an average value of $17.60 per ton, paying duty equivalent to 22.73 per cent. ad valorem, while

In 1907, 12,653.12 tons of ferrosilicon were imported of an average value of $72.26, paying duty equivalent to 5.54 per cent. ad valorem.

These figures prove that the Dingley bill was framed when the 50 per cent. grade of ferrosilicon was commercially unknown, and also show that the old duty was totally inadequate to protect the domestic manufacturer of the new commercial product, namely, high percentage of ferrosilicon, which could only be made in the electric furnace at a cost far greater than that of the blast furnace product contemplated by the Dingley bill.

The point that "Foundryman" entirely overlooks, or expressly misstates, is that 15 per cent. ferrosilicon and 50 per cent. ferrosilicon are essentially different. The former alloy is a low priced product of the blast furnace, and the latter a comparatively high priced product of the electric furnace, manufactured by a process necessarily expensive, involving heavy initial capital outlay for plant, expensive labor, and highly paid technical supervision.

The intention of both the Ways and Means Committee and the Senate Finance Committee, who are fully informed upon the subject, was evidently to justly and adequately protect the products of the electric furnace from unfair foreign competition by differentiating these products from products of the blast furnace, which fell into their own natural classification.

The electric furnace industry is in its infancy, and deserves encouragement at the present time, especially in view of the position which it will ultimately take in the steel in-

dustry of the country, after the initial expensive pioneer work, of which the ferroalloy business is an example, has borne fruit.

It is right and logical to class ferrosilicon over 15 per cent. with the high priced ferroalloys, the difference in price representing merely the difference in value of the metal in the alloy other than the iron. It is quite incorrect to infer that protecting domestic ferrosilicon would cause any hardship to any steel maker in the Union. The principal and growing use for 50 per cent. ferrosilicon is in open hearth practice, and here the amoust used is so small (about ½ of 1 per cent.) that a small increase in price of ferrosilicon would be absolutely negligible in the cost of steel. The silicon thus introduced is not lost, but is introduced to increase the silicon content of the steel as well as to deoxidize it.

Another large use of high grade ferrosilicon is in the manufacture of high silicon irons for electrical purposes, and here the electric furnace product is essential to obtain the required purity.

Under the old conditions of the Dingley law there was no stability in the price of 50 per cent. ferrosilicon. The supply was almost entirely in the hands of the foreigner who used his practical monopoly to extort from the domestic consumer unreasonable and excessive prices for his goods. Immediately, however, that domestic production began the importers dropped their prices continuously until the difference between foreign and domestic costs made it impossible for a domestic manufacturer to compete.

Should the present bill provide no adequate protection to the American manufacturer, without a doubt a domestic industry will be killed, and under the regained foreign monopoly the price of 50 per cent. ferrosilicon will again rise to a point higher than that which a protective tariff would have fixed as a stable basis.

The ferrosilicon industry involved is a new one, one in which much capital is invested, and although located under the most favorable circumstances is unable to compete with the dumping of surplus foreign production. The product, on the other hand, is essential to the steel trade, and we submit that no interest is more worthy of encouragement.

We cannot believe that the call for tariff revision contemplates such provisions in the new law that a new and useful industry would be crippled only to allow the foreigner to reassume control of an American market and establish conditions necessarily unstable and monopolistic in character.

This domestic industry is represented by at least three plants and is open to all who, guided by the ordinary laws of supply and demand, consider the enterprise a good business venture. We feel confident that it was with full knowledge of the facts, and because of this knowledge, that the schedules in question have been proposed and the rates fixed which are in no sense prohibitive.

SUSQUEHANNA SMELTING COMPANY.
LOCKPORT, N. Y., May 10, 1909.

Metal Trades Testimonial Dinner at Cleveland.

A testimonial dinner of welcome, that proved a very enjoyable affair, was given by the Cleveland Branch of the National Metal Trades Association at the Hollenden Hotel, on the evening of May 15, in honor of Howard P. Eells, president of the association, and Robert Wuest, the commissioner. About 60 were present, including members of the local branch, national councillors and other guests. L. D. Weaning of the Variety Iron & Steel Works Company, president of the Cleveland Branch, acted as toastmaster.

Mr. Weaning voiced the sentiments of the Cleveland members when he expressed pleasure over the removal of the national offices from Cincinnati to Cleveland. After a few remarks he introduced President Eells, who referred to the work of the organization, speaking particularly about the changes that had developed in its purposes. He said that formerly the strike fighting idea was the main motive of the association, but this is no longer the case. Now great results are expected from ultimately bringing together workmen and employees in the line of mutual co-operation and in that way settling the labor question. He did not object to labor unions but to the men that control the unions. The organization, he said, was trying to protect its members from the unreasonable encroachments of labor.

Commissioner Wuest spoke of the work of the association and of the benefit which labor derived from it through the employment bureaus. M. H. Barker, American Tool & Machine Company, Boston, Mass., spoke very eulogistically of the work of Commissioner Wuest. M. K. Bowman, Griscom-Spencer Company, New York City, expressed the opinion that the local branches should keep in closer touch with the foremen and that the latter should be invited to the local meetings. Mr. Weaning said that the Cleveland Branch had at least partially solved that problem by the formation of the Superintendents' and Foreman's Club. Brief speeches were made by Paul B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y.; President Charles S. Howe, Case School of Applied Science, Cleveland; F. F. Prentiss, Cleveland Twist Drill Company, and others. Messages of regret that they were unable to be present were received from United States Senator Theodore Burton and Congressman Paul Howland.

The Standard Screw Company's Report.

The annual report of the Standard Screw Company for the year ending March 31, 1909, shows net earnings of $73,504. Dividends aggregating $269,514 were paid, resulting in a deficit for the year of $196,010, against a surplus of $183,113 for the previous year. Details for the two years are as follows:

	1908-09.	1907-08.
Manufacturing profits and other income	$136,455	$514,183
Expenses	42,807	38,002
Net income	$93,648	$476,181
Bond and other interest	20,144	23,434
Available for dividends	$73,504	$452,747
Dividends paid	269,514	269,634
Deficit or surplus	—$196,010	+$183,113

As the company's surplus at the end of the fiscal year 1908 was $905,952, the deficit for 1909 still leaves $709,942. President W. B. Pearson says:

"During the period covered by this report we have passed through the most serious business depression that has occurred since the organization of the company, considering which I am of the opinion that the net profits, as shown by the accompanying statement, will be regarded as quite satisfactory. It will be observed that it has been necessary to draw on our surplus to keep up the dividends, but as the surplus was allowed to accumulate with that purpose in view, I think this can only be construed as showing the wisdom of our conservative policy. During the last three months the volume of business has been constantly increasing, thus enabling us to effect a slight betterment in prices, all of which leads me to predict with confidence for the coming year results which will be pleasing to all concerned."

The company owns the following subsidiaries: Chicago Screw Company, Detroit Screw Works, Worcester Machine Screw Company, Illinois Screw Company, Hartford Machine Screw Company, Western Automatic Machine Screw Company, Pearson Machine Company and Walker & Ehrman Mfg. Company. Its principal products are machine screws and screw making machinery. Its main office is at Detroit, Mich.

The Revere Copper and Kinsley Iron Properties to Be Sold.

J. E. Conant & Co., Lowell, Mass., auctioneers, announce the sale on Thursday, May 27, and Friday, May 28, beginning at 1.30 p.m. on the first day, of the properties of the Revere Copper Company and the Kinsley Iron & Machine Company at Canton, Mass. Canton is within 16 miles of the business center of the city of Boston. The property of the Revere Copper Company comprises about 42 acres of land with a large number of buildings. The property of the Kinsley Iron & Machine Company comprises an area of 243,800 sq. ft. of land with numerous buildings, consisting of a large rolling mill, forging plant, machine shop and foundry. Both of these works have an interesting history. The Revere Copper Company's plant was established in 1801 and the Kinsley Iron & Machine Company's plant was established in 1787. The Kinsley plant in 1907 was stated to have been at that time the sole manufacturing plant in continuous operation for so long a time in this country. These properties are offered for sale because the owners have much larger interests that demand their entire attention. The sale will take place on the premises.

subject as it is now presented by those who contribute to the improved construction.

CORRESPONDENCE.

The Isolated Power Plant.

To the Editor: The replies published March 18 to my article upon the subject of isolated power plants in *The Iron Age* of February 18, warrant some comment by me. I have rarely had the good fortune to find in the arguments of these who differ from me such striking and serviceable illustrations for my own views as are presented in particular in the reply of Percival Robert Moses. Job himself would have been satisfied to have his adversary write such a reply or edit such a magazine as Mr. Moses' *Isolated Plant.*

Now, I reached in my article and still hold two conclusions which I regard as important: First, that no argument for an isolated plant is fair or wise which does not consider all the probable elements which enter into real cost. Second, that when consulting engineers discuss or act upon this subject they show an ever recurring bias. I do not mean that they would burn down a temple to be famous like the Greek in the legend. I disclaim again, as I have done from the start, any suggestion that they have an active and conscious corrupt motive in advising that they should receive commissions. But just as we who are lawyers are in truth more in favor of litigation than laymen, so consulting engineers are equally dangerous in the way in which they approve of the value of their own services.

Under the first head I am able to draw from the reply by Mr. Moses some astonishing examples of neglected items of cost. But let me first correct a serious error in arithmetic. Every sinking fund is measured by clear thinkers, not by its annual appropriation, but by the time within which it will create a sufficient sinking fund. My allowance of 5 per cent., to which Mr. Moses also commits himself, was for a 13½ year fund. By saying that "interest should be reduced each year as the investment is written off," he has abstracted from this fund for the benefit of "interest" the interest on the sinking fund. Either this is a grave arithmetical error or else he stretches the sinking fund period to 20 years without saying so frankly. Turning to costs themselves, I observe that he states the cost of the Security Mutual Life Building plant, without allowing 1 cent either for repairs or for profit. And he states the monthly operation cost of the Langdorf Building at the rate per year of $5400, comparing it with Central Station estimates of $7000, without any indication whatever that the figures which he gives allow or do not allow for rent, interest, depreciation, taxes, insurance, repairs or profit. To quote Mr. Moses, "these are the facts" about his alleged facts and no amount of theorizing can make up for such omissions.

Nor are these samples of omissions unfair or accidental. They are not only typical of the advocate of isolated plants, but they come from the typical advocate. Under all circumstances it is temperate in me to have said that the average owner had better not make such a man "judge of whether" he should have a commission." RICHARD W. HALE.

BOSTON, MASS.

REPLY TO THE ABOVE.

To the Editor: Mr. Hale states that he is satisfied with my reply and with the magazine I edit entitled *Isolated Plant.* As I remember my biblical history, Job was rather easily satisfied, and I judge that some of Mr. Hale's confreres regard the magazine more in the light of a plague; otherwise the publishers of this magazine would not receive a letter from one of their advertisers stating that because of threats by "interests antagonistic" to the publication they were obliged to cancel their contract for a year's advertising.

Now, as to Mr. Hale's conclusion. I still think that he did suggest that consulting engineers had an active and consciously corrupt motive in advising that they should receive larger commissions.

Mr. Hale makes a correction of what he terms a serious error in arithmetic. This is a practical question, to be determined by the practical business man. If he invests $1000 and at the end of the year saves out of the earnings $50 for interest on the $1000 he invested and $50 to repay the first cost, his investment at the beginning of the second year is certainly not $1000, but $950, and the interest is to be figured at the end of the second year on the $950 and not on the full amount of the original investment. Any other course would mean that at the end of the sinking fund period he would still be charging himself 5 per cent. on the original investment, although all the original investment had been repaid.

While on this subject of interest and depreciation, it seems proper to call attention to a phase that has been neglected. This was brought to my attention by Mr. Price of the De La Vergne Company, and it seems to me that his reasoning is entirely sound. He says: "If it is proper to figure the interest on the cost of the plant, why is it not proper to figure interest on the excess cost each year if a plant were not installed?" In other words, if the cost of producing electricity from the private plant—leaving out all fixed charges for the present—is $3000 less than the cost of purchasing it from the central service, should not interest be figured on this excess $3000 during the term of comparison? I think it should.

If the period of comparison be fixed at 15 years, and the excess cost at $3000 a year—*i. e.*, the difference between the cost of purchasing the current and the cost of manufacturing it—the interest on this excess cost would be over $6500. That is, there would be interest on $3000 for 14 years, interest on a second $3000 for 13 years, interest on a third $3000 for 12 years, &c. This item of interest on excess annual cost will usually be found to far outweigh the interest chargeable to the plant investment.

To return to Mr. Hale's letter; regarding the cost of the Security Mutual Life Building, he states that I have not allowed 1 cent either for repairs or for profit. As to repairs, I have shown all the costs as given me by the comptroller, and I have the figures for several years, and all repairs are included. As for the profits, I think I have clearly stated what the difference would be between the cost of operation and the cost of central service, and this is the profit less the fixed charges. In another part of my reply, I spoke about the fixed charges and as to what allowance should be made. I think any fair-minded reader, in reading over this article, would see that there was no attempt whatsoever made to hide the truth.

In the case of the Security Mutual and in the case of the Langsdorf Building, the actual conditions do not warrant any allowance for rent, taxes or insurance. The buildings were designed and built before the plants were designed, and space was allotted for the machinery without regard as to whether an electric plant was to be installed or not. In fact, in the case of the Langsdorf Building, the contract was practically signed with the New York Edison Company when the owners decided to investigate further and finally installed their own plant, and no additional space was taken up. No increase has been made in the taxes because of the installation of the plant, nor in insurance. These are the practical facts and there were no omissions. It is easy to figure that there should be insurance and that there should be taxes, but a practical man knows that unless the plant is a large proportion of the cost of the building there will be no increase because of the presence of the electric plant on the building.

NEW YORK CITY. PERCIVAL ROBERT MOSES.

The Duty on Ferroalloys.

To the Editor: In *The Iron Age* of May 6, there appeared a letter signed by "Foundryman," upon the subject of the proposed new duties on ferroalloys, which so entirely misstates the case that we ask the courtesy of your columns for reply.

The Dingley law, it is true, provided a duty of $4 a ton on ferrosilicon and ferromanganese, classing them with pig iron, but at that time 50 per cent. ferrosilicon was commercially unknown, and the commodity intended to be taxed was the blast furnace product containing 12 to 15 per cent. silicon. This is beyond dispute, since the United States customs returns show:

In 1897, 1,324.93 tons of ferrosilicon imported of an average value of $17.60 per ton, paying duty equivalent to 22.73 per cent. ad valorem, while

In 1907, 12,653.12 tons of ferrosilicon were imported of an average value of $72.26, paying duty equivalent to 5.54 per cent. ad valorem.

These figures prove that the Dingley bill was framed when the 50 per cent. grade of ferrosilicon was commercially unknown, and also show that the old duty was totally inadequate to protect the domestic manufacturer of the new commercial product, namely, high percentage of ferrosilicon, which could only be made in the electric furnace at a cost far greater than that of the blast furnace product contemplated by the Dingley bill.

The point that "Foundryman" entirely overlooks, or expressly misstates, is that 15 per cent. ferrosilicon and 50 per cent. ferrosilicon are essentially different. The former alloy is a low priced product of the blast furnace, and the latter a comparatively high priced product of the electric furnace, manufactured by a process necessarily expensive, involving heavy initial capital outlay for plant, expensive labor, and highly paid technical supervision.

The intention of both the Ways and Means Committee and the Senate Finance Committee, who are fully informed upon the subject, was evidently to justly and adequately protect the products of the electric furnace from unfair foreign competition by differentiating these products from products of the blast furnace, which fell into their own natural classification.

The electric furnace industry is in its infancy, and deserves encouragement at the present time, especially in view of the position which it will ultimately take in the steel in-

dustry of the country, after the initial expensive pioneer work, of which the ferroalloy business is an example, has borne fruit.

It is right and logical to class ferrosilicon over 15 per cent. with the high priced ferroalloys, the difference in price representing merely the difference in value of the metal in the alloy other than the iron. It is quite incorrect to infer that protecting domestic ferrosilicon would cause any hardship to any steel maker in the Union. The principal and growing use for 50 per cent. ferrosilicon is in open hearth practice, and here the amoust used is so small (about ½ of 1 per cent.) that a small increase in price of ferrosilicon would be absolutely negligible in the cost of steel. The silicon thus introduced is not lost, but is introduced to increase the silicon content of the steel as well as to deoxidize it.

Another large use of high grade ferrosilicon is in the manufacture of high silicon irons for electrical purposes, and here the electric furnace product is essential to obtain the required purity.

Under the old conditions of the Dingley law there was no stability in the price of 50 per cent. ferrosilicon. The supply was almost entirely in the hands of the foreigner who used his practical monopoly to extort from the domestic consumer unreasonable and excessive prices for his goods. Immediately, however, that domestic production began the importers dropped their prices continuously until the difference between foreign and domestic costs made it impossible for a domestic manufacturer to compete.

Should the present bill provide no adequate protection to the American manufacturer, without a doubt a domestic industry will be killed, and under the regained foreign monopoly the price of 50 per cent. ferrosilicon will again rise to a point higher than that which a protective tariff would have fixed as a stable basis.

The ferrosilicon industry involved is a new one, one in which much capital is invested, and although located under the most favorable circumstances is unable to compete with the dumping of surplus foreign production. The product, on the other hand, is essential to the steel trade, and we submit that no interest is more worthy of encouragement.

We cannot believe that the call for tariff revision contemplates such provisions in the new law that a new and useful industry would be crippled only to allow the foreigner to reassume control of an American market and establish conditions necessarily unstable and monopolistic in character.

This domestic industry is represented by at least three plants and is open to all who, guided by the ordinary laws of supply and demand, consider the enterprise a good business venture. We feel confident that it was with full knowledge of the facts, and because of this knowledge, that the schedules in question have been proposed and the rates fixed which are in no sense prohibitive.

SUSQUEHANNA SMELTING COMPANY.
LOCKPORT, N. Y., May 10, 1909.

Metal Trades Testimonial Dinner at Cleveland.

A testimonial dinner of welcome, that proved a very enjoyable affair, was given by the Cleveland Branch of the National Metal Trades Association at the Hollenden Hotel, on the evening of May 15, in honor of Howard P. Eells, president of the association, and Robert Wuest, the commissioner. About 60 were present, including members of the local branch, national councillors and other guests. L. D. Weaning of the Variety Iron & Steel Works Company, president of the Cleveland Branch, acted as toastmaster.

Mr. Weaning voiced the sentiments of the Cleveland members when he expressed pleasure over the removal of the national offices from Cincinnati to Cleveland. After a few remarks he introduced President Eells, who referred to the work of the organization, speaking particularly about the changes that had developed in its purposes. He said that formerly the strike fighting idea was the main motive of the association, but this is no longer the case. Now great results are expected from ultimately bringing together workmen and employees in the line of mutual co-operation and in that way settling the labor question. He did not object to labor unions but to the men that control the unions. The organization, he said, was trying to protect its members from the unreasonable encroachments of labor.

Commissioner Wuest spoke of the work of the association and of the benefit which labor derived from it through the employment bureaus. M. H. Barker, American Tool & Machine Company, Boston, Mass., spoke very eulogistically of the work of Commissioner Wuest. M. K. Bowman, Griscom-Spencer Company, New York City, expressed the opinion that the local branches should keep in closer touch with the foremen and that the latter should be invited to the local meetings. Mr. Weaning said that the Cleveland Branch had at least partially solved that problem by the formation of the Superintendents' and Foreman's Club. Brief speeches were made by Paul B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y.; President Charles S. Howe, Case School of Applied Science, Cleveland; F. F. Prentiss, Cleveland Twist Drill Company, and others. Messages of regret that they were unable to be present were received from United States Senator Theodore Burton and Congressman Paul Howland.

The Standard Screw Company's Report.

The annual report of the Standard Screw Company for the year ending March 31, 1909, shows net earnings of $73,504. Dividends aggregating $269,514 were paid, resulting in a deficit for the year of $196,010, against a surplus of $183,113 for the previous year. Details for the two years are as follows:

	1908-09.	1907-08.
Manufacturing profits and other income	$136,455	$514,183
Expenses	42,807	38,002
Net income	$93,648	$476,181
Bond and other interest	20,144	23,434
Available for dividends	$73,504	$452,747
Dividends paid	269,514	269,634
Deficit or surplus	—$196,010	+$183,113

As the company's surplus at the end of the fiscal year 1908 was $905,952, the deficit for 1909 still leaves $709,942. President W. B. Pearson says:

"During the period covered by this report we have passed through the most serious business depression that has occurred since the organization of the company, considering which I am of the opinion that the net profits, as shown by the accompanying statement, will be regarded as quite satisfactory. It will be observed that it has been necessary to draw on our surplus to keep up the dividends, but as the surplus was allowed to accumulate with that purpose in view, I think this can only be construed as showing the wisdom of our conservative policy. During the last three months the volume of business has been constantly increasing, thus enabling us to effect a slight betterment in prices, all of which leads me to predict with confidence for the coming year results which will be pleasing to all concerned."

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Electric Furnace Steel Rails.

A portion of the paper read by Dr. F. A. Kjellin before the recent Niagara Falls meeting of the American Electrochemical Society related to steel rails, from which the following extracts are taken:

For some time steel made in a Roechling-Rodenhauser electric furnace has been manufactured into rails of standard section for use on the United Prussian State Railways. The administration of these lines has drawn up specifications with reference to electric furnace steel rails, particularly as to physical qualities and resistance to wear, as follows:

Tensile strength for track rails, a minimum of 70 kg. per square millimeter, or about 99,000 lb. per square inch.

For point or switch rails, 75 kg. per square millimeter, or about 160,000 lb. per square inch.

For ordinary basic Bessemer rails, a tensile strength of 60 kg. per square millimeter, or about 85,000 lb. per square inch, is stipulated.

Elongation, in the case of electric steel rails, a minimum of 10 per cent., determined on samples 200 mm. (about 8 in.) between marks.

Drop tests specify 80 mm. minimum bend (about 3 3-16 in.) on a bar 1 m. (39.37 in.) between supported ends, with a falling weight of 1500 m.-kg. (about 10,800 ft. pounds).

Guaranteed life of track rails, 10 years; of point rails, seven years.

Some data have been supplied by Herman Roechling, giving test figures for some charges of electric steel rails, and ordinary basic Bessemer steel rails, as given below, being the mean of six charges of electric furnace rails and 16 charges of basic Bessemer rails:

	Car. %	Phos. %	Sul. %	Man. %	Si. %	Tensile strength lbs. per sq. in.	Elongation. %	Contraction. %
Electric steel	0.54	0.056	0.042	0.984	0.21	119,000	15.4	24.1
Basic Bessemer steel	0.36	0.073	....	1.127	...	97,000	17.6	26.2

At Dommeldingen very impure pig iron was charged into an induction furnace of the Roechling-Rodenhauser type, and refined as follows:

	Analysis of charge. Per cent.	Analysis of cast. Per cent.
Carbon	4.0	0.5
Phosphorus	1.8	0.025
Sulphur	0.2	0.03
Manganese	0.0	0.76
Silicon	1.0	0.056

Mechanical Tests.

Breaking strain	95,000 lb. per sq. in.
Elongation	20 per cent.
Contraction of area	36.33 per cent.
Duration of conversion	5 hr.

The following concluding remarks may be quoted from a Voelklingen report, dated February 18, 1909:

"The tests, the results of which are given in the annexed report on material supplied, were carried out on electric steel rails, section 8, which we have up to the present supplied to the Prussian Government. The elongations of the samples are determined at a distance between the marks of 200 mm. The ball pressure tests were carried out according to the stipulations of the Prussian Railways. The high elongation figure as compared with the comparatively high tensile strength figure is striking. The drop tests executed have given quite extraordinary results. When striking at 1500 meter-kilos, at least six blows (charge No. 550) were needed in order to obtain the bend of 80 mm. of a bar 1 m. long between supported ends, whereas for the charge No. 613 as much as eight blows were required. When testing the charges Nos. 522 and 632, the piece of rail submitted to the drop test after having obtained a bend of 80 mm. was to be broken by a blow of 4000 meter-kilos. However, the result was that the two test pieces, upon being subjected to the blow, bent at respectively 126 and 123 mm. without breaking, and they could only be broken by putting the rails once more under the falling block and submitting to further blows.

"The composition of the rails is similar to that of the ordinary basic Bessemer steel rails, only the higher carbons corresponding to the higher tensile strength (minimum 99,000 lb. per square inch) which is specified. The favorable result of the electric steel rails as compared with the basic Bessemer rails can only be obtained through the 'killing' of the material in the electric furnace, under a slag which facilitates the deoxidation and the escape of the gases."

Customs Decisions.

Enameled Steel Ware.

Domestic manufacturers of enameled steel ware goods, principally kitchen articles, received a setback when the Board of United States General Appraisers, in a decision by I. F. Fischer, declined to uphold higher duties on German-made enameled ware imposed by the local appraiser, George W. Wanmaker. For many years the competition between the domestic makers, headed by the American Enameled Ware Company and the Lalance & Grosjean Mfg. Company, on the one hand, and Stransky & Co., representing the German manufacturers, on the other, has been most keen. The German makers, who are strongly organized, have built up a heavy demand for their products in this country. The American manufacturers, too, have in recent years grown in importance.

In the latest case, Stransky & Co., entered a large importation of light blue lipped saucepans invoiced at various prices. It alleged that the invoice values were lower than the actual foreign market values, whereupon Appraiser Wanmaker raised the invoice prices and exacted the 45 per cent. duty on the increased valuation. The importers appealed to the board for a reappraisement, and, after a consideration of the evidence, General Appraiser Fischer sustains the prices at which the German goods were entered, thereby reversing the general appraiser.

Stamped Steel Ornaments.

Acting in harmony with a recent decision of the United States Circuit Court, the board has sustained a claim filed by A. & H. Veith, New York, for lower duty on steel stampings used in the manufacture of steel point ornaments for women's dresses and hats. The merchandise is in the form of strips or individual pieces, which have been stamped and pressed out of sheets of steel into an openwork raised pattern and then sheared into desired widths or forms. For some years the Government has been classifying the merchandise as "manufactures of metal" with a duty of 45 per cent. This classification, however, the court has decided to be erroneous. It is held that the articles properly fall under the paragraph in the tariff act for "pressed, sheared or stamped shapes" of steel, and dutiable at specific rates. The Treasury Department having decided not to prolong the litigation, the Board of Appraisers acts in accordance with the court's ruling. The board's decision says that the stamping, with certain exceptions, are fairly with the tariff provision for "stamped shapes."

Iron Sand.

The United States Circuit Court of Appeals at Boston has made a decision adverse to the importers in a test case regarding the classification of so-called iron sand. The sand is manufactured or put in shape for use through melting iron and steel scrap. A thin stream of the molten metal is subjected to a blast of steam which scatters it into small particles varying in size, which, dropping into water, are chilled and shaped. The merchandise was assessed by the customs authorities as "manufactures of metal," with a duty of 45 per cent.

According to the importer, the Harrison Supply Company, the articles should be classified at lower rates under the provision in paragraph 124 for "iron less finished than iron in bars." The court says that it would be unreasonably straining a point to hold that Congress intended to include iron sand on a parity with iron in bars, pig iron and other kinds of bulky iron products. The assessment of 45 per cent. is affirmed and the protest of the importer overruled.

The Allis-Chalmers Company has moved its Cincinnati office, in charge of F. C. Colwell, to 1603 First National Bank Building, and its Cleveland office, W. B. Huskey, manager, to 1407-9-11-13 Schofield Building.

PERSONAL.

Carl Franck, formerly purchasing agent and attorney in fact for the Arthur Koppel Company, Berlin, Pittsburgh and Koppel, Pa., and at present on a European trip, has severed his connection with that concern. He expects to return to America in a short time and will probably take over the American management of a large German corporation, having his headquarters in New York.

G. Stengel, Jr., secretary and treasurer of the Pittsburgh Tool Steel Wire Company, Monaca, Pa., has sailed for Europe, to be gone about two months.

R. L. Radcliffe, sales engineer of the Fred M. Prescott Steam Pump Company, West Allis, Wis., has been appointed district manager at Atlanta, Ga., with office in the Candler Building.

Barney Elshoff, superintendent of the electrical shops at Allis-Chalmers Company's West Allis Works, has resigned to engage in another line of work. He is succeeded by R. L. Alexander.

The Brayton Engineering Company, St. Paul, Minn., has placed L. F. Brayton in charge of its Seattle office.

H. C. Frick is expected to return from Europe soon.

A. M. Boughton, Chicago, has been engaged by the Twin City Equipment Company, Minneapolis, as sales engineer for concrete machinery, mixers, crushers, &c.

The Sterling Electric Mfg. Company, Warren, Ohio, has placed P. L. Hoadley in charge of a branch sales office recently opened in the Central Building, Seattle, Wash.

A. W. Burchard, vice-president of the General Electric Company, sailed for Europe May 15.

E. D. Giberson and Frank E. Olin, formerly connected with the New York sales agency of the National Tube Company, have been appointed Eastern sales agents of the Ohio Seamless Tube Company, Shelby, Ohio, with offices at 2 Rector street, New York. The Eastern territory will be handled by the New York office, to which all inquiries originating in that territory should be addressed.

Claude E. Holgate, who for the past 10 years has filled the position of assistant to the general manager and in charge of the sales department of Gould & Eberhardt, Newark, N. J., has resigned to take charge of the automobile department of a daily paper in that city.

Judge E. H. Gary, accompanied by President E. J. Buffington and Vice-President G. G. Thorp, together with other officials of the Indiana Steel Company, made a visit of inspection to the new steel works at Gary, Ind., May 13. At a reception tendered at the Gary Hotel by the citizens of the town, Judge Gary spoke in a complimentary way of the wonderful growth of the city, and took occasion to express his confidence in the success of the company's new enterprise and the early restoration of normal industral conditions. The feature of especial interest in connection with this occasion was the announcement of plans for the construction of a Young Men's Christian Association Building costing $100,000, to be presented to the city by Judge Gary.

George C. Stone, formerly manager of the Pennsylvania Works of the American Sheet & Tin Plate Company, has been made manager of the New Castle Works at New Castle, Pa., and Joseph U. Harthill of Cambridge, Ohio, has been made manager of the Pittsburgh Works at New Kensington.

Frank Schwep, purchasing agent for the Ingersoll-Rand Company, has returned to New York after an extended business trip in South Africa and Australia.

Robert Kemp Wright, who has spent the last five years in Trinidad and Venezuela in the interests of the Barber Asphalt Paving Company, returned to this country May 17 and will in the future have his offices in Philadelphia as assistant to the president of the company.

Frederick W. Cox, who has represented the Cambria Steel Company as Buffalo sales agent for the past four years, has been appointed to the position formerly held by Joseph G. Rittenhouse, Jr., as Philadelphia sales agent and assistant manager of sales for the Cambria Steel Company, with offices at Philadelphia.

William C. Herron, former partner in Rogers, Brown & Co., Cincinnati, is critically ill.

OBITUARY.

STANLEY G. SMITH, Woonsocket, R. I., secretary of the American Wringer Company, and prominent in other industries, was killed in an automobile accident, May 15. He was 41 years of age.

JAMES M. OSBORN, founder of the J. M. & L. A. Osborn Company, Cleveland, Ohio, dealer in sheets, tin plate, &c., died May 12, aged 74 years. He was born in Rensselaer, N. Y. In the early '50's he located in Akron, Ohio, where he entered the stove manufacturing business with R. P. Myers. In 1859 the factory was moved to Cleveland and the business was conducted under the name of Myers, Osborn & Co. Some years later Mr. Osborn withdrew to engage in the tin plate business, and in 1891 with his son founded the J. M. & L. A. Osborn Company, of which he was the head until about 10 years ago, when he retired because of poor health. Since then the business has been under the management of his son, L. A. Osborn. He leaves another son, Dr. W. O. Osborn of Cleveland.

J. OGDEN HOFFMAN, Philadelphia, for many years the representative of the Carnegie Steel Company in that city, died May 18.

HENRY H. ROGERS, a director of the United States Steel Corporation, one of the leading officers of the Standard Oil Company, and an officer or director of numerous other corporations, died in New York City May 19, aged 69 years. He was a native of Massachusetts, and rose from comparative poverty to a position of commanding influence in the business of the country. He leaves a widow, one son and three daughters.

OSCAR MARSCHENTZ, manager of the Louisville plant of the Standard Sanitary Mfg. Company, died May 18, in Cincinnati, of acute indigestion. He was attending the foundrymen's convention. He had been identified with the Louisville plant for 21 years, and was superintendent also of all the Standard Company's foundries.

Powdered Ferrotungsten.—A German steelmaker informs *Stahl und Eisen* that he has had favorable results in making high speed steels with powdered ferrotungsten which is being produced by the Chemische Fabrik Fuerth. Analyses show that it contains 85 per cent. of tungsten, 0.30 carbon, 0.45 silicon, 0.45 manganese, 0.25 aluminum, calcium and magnesium and 0.01 of sulphur. Tin, phosphorus, copper and arsenic could not be detected. Ferrotungsten melts at considerably lower temperature than tungsten metal, and it is far less subject to oxidation than the pure metal. Slagging of the tungsten is low, so that the loss of this dear metal is almost *nill*. The powdered ferrotungsten alloys more readily. The segregation is less and the steel is not so much subject to piping.

The Railway Steel Products Company, Elyria, Ohio, has been incorporated with a capital of $100,000. It will be a selling company instead of a manufacturing company, at least for the present, and will succeed the Hart Steel Company, which has been a selling company for the Elyria Iron & Steel Company. The latter company will, as in the past, manufacture tie plates, spikes and other materials. All the stock of the new company is owned by the Youngstown Sheet & Tube Company and Elyria Iron & Steel Company.

The Dake-American Steam Turbine Company, Grand Rapids, Mich., has let contract for a new brick factory building, two stories, 60 x 128 ft.

The National Association of Manufacturers.

The fourteenth annual meeting of the National Association of Manufacturers opened at 2 p.m. on Monday, May 17, in the Waldorf-Astoria Hotel, New York, with President James W. Van Cleave of St. Louis in the chair. A large number of prominent manufacturers in all the leading branches of trade was present. After the usual formalities of opening, the appointment of committees and general announcements, Chairman Anthony Ittner of St. Louis presented the report of the Committee on Industrial Education, making a severe attack on organized labor. The report declared that, although industrial education was making such strides that the committee might be dispensed with, it might still be of service "to keep the movement free from the domination of organized labor, which has its own special purposes in view and tends to sacrifice the public welfare to the supposed advantage of a class." One of the members of the committee, Frederick W. Sivyer of Milwaukee, refused to sign the report, dissenting from the attack on organized labor.

The Committee on Traffic, William A. Vawber, chairman, presented a most interesting report, dealing with the railroad question comprehensively and quite liberally. Believing that this matter can be handled most effectively through a large organization, the report recommended that the Traffic Committee be made permanent, and that a special department should be organized for this purpose in the New York office of the association.

The Committee on Banking and Currency, D. A. Tompkins, chairman, reviewed the currency situation and recommended the indorsement of the Fowler currency bill.

An address on the cultivation of the export trade, giving practical suggestions, was made by John Barrett, director of the International Bureau of American Republics, Washington, D. C.

On Tuesday President Van Cleave made the annual presidential address, in which he ably defended the policy of the association in combating the activities of the American Federation of Labor, claiming that a service of supreme value was thus being rendered to every patriotic American in every walk of life. He reviewed the work thus done in the past year and drew the conclusion that "there is a direct incentive for us as employers, as well as of good citizens, to use all legitimate means at our command in the session of Congress two-thirds of a year hence to defeat once more the demand for particular privileges in the way of lawbreaking for members of the labor societies." He strongly urged the appointment of a Tariff Commission.

S. D. Scudder of the International Banking Corporation, New York, delivered an address on "The Open Door —Your Opportunity," urging the manufacturers before him to become foreign merchants as well as local manufacturers and pointing out obstacles which should be overcome in developing a foreign trade.

F. R. Boocock of the American Antiboycott Association addressed the convention on "Law and Reason—Labor's Two Best Friends."

Thomas E. Durban made an address on "Desirable Improvements in Interstate Trade," setting forth the obstacles to business now encountered in conflicting State laws.

The report of the Committee on Tariff and Reciprocity, H. E. Miles, chairman, precipitated a heated and protracted discussion. The report recommended the acceptance of the Senate Finance Committee's proposition regarding the appointment of a permanent Tariff Commission. Some of the participants in the discussion objected to the impression having been widely spread that the association favors a revision of the tariff downward. The report of the committee was finally adopted, but James F. Massey was appointed a committee of one to draft a resolution stating unmistakably the association's stand for a protective tariff.

The Committee on Nominations reported the name of John Kirby, Jr., Dayton, Ohio, for the office of president, Mr. Van Cleave having declined to serve in that capacity for another year.

The convention continued its sessions on Wednesday, closing with a banquet in the evening.

New Publication.

Tests on the Power Requirements of Rolling Mills (Versuche zur Ermittlung des Kraftbedarfs an Walzwerken). By Dr. J. Puppe. Published by the Verein deutscher Eisenhuettenleute, Dusseldorf, Germany.

The full report of the special commission appointed by the German ironmasters to study the power requirements of rolling mills has now been issued in the form of a volume. It consists chiefly, of course, of a mass of tables, of figures and of diagrams giving the records of the tests made. The character of the work done was fully shown in the abstract of the paper which was published in *The Iron Age* of March 11, 1909.

Some points about combustion will be brought out in the bulletin on the smokeless combustion of coal in boiler plants to be issued by the United States Geological Survey, Technologic Branch, covering a study of conditions found in industrial establishments in 13 large cities. It is emphasized that automatic stokers or furnaces must be set so that combustion will be complete before the gases strike the heated surface of the boiler. When partly burned gases at a temperature of, say, 2500 degrees F. strike the tubes of a boiler at, say, 350 degrees F., combustion is necessarily hindered, and may be entirely arrested. The length of time required for the gases to pass from the coal to the heating surface probably averages considerably less than one second, a fact which shows that the gases and air must be intimately mixed when large volumes of gas are distilled, as at times of hand firing, or the gas must be distilled uniformly as in a mechanical stoker.

The increase in imports which has been noted for several months still continues. The Bureau of Statistics of the Department of Commerce and Labor reports that the imports in April amounted to $122,211,068, which is an increase of $34,773,241 over the imports of April, 1908. The exports of merchandise in April were valued at $125,201,219, which is a decrease of $8,156,737, compared with April, 1908. It is stated that the increase in imports is still chiefly in materials for use in manufacturing.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has decided to engage in the manufacture of heavy steel castings, and will install a 20-ton open hearth furnace. The company will manufacture rolls, mill and other heavy castings in steel, which it has formerly been furnishing in iron. The open hearth furnace and other steel foundry equipment will be installed in the present buildings.

It is expected that active work of overhauling the plants of the Southern Iron & Steel Company will soon begin. If that is done the company would, no doubt, be producing pig iron within 90 days at its Alabama City furnaces and be ready to make steel 30 days afterward. The Trussville Furnace could be put on foundry iron within about 60 days. This company is a reorganization of the old Southern Steel Company.

The United States Steel Corporation on May 9 made, at the National Tube Works, McKeesport, Pa., an important move toward the total abolition of Sunday work in its mills. It is stated that this policy is to be gradually applied to all the mills of the Steel Corporation in the Pittsburgh District. Only those operations which must be continuous will then require men to be employed on Sunday.

NEWS OF THE WORKS.

Iron and Steel.

The furnace of the Central Iron & Coal Company, at Holt, Ala., went out of blast May 17 for a general overhauling.

The Tennessee Coal, Iron & Railroad Company is running three furnaces at Bessemer, Ala., on foundry iron, while all the stacks at Ensley are idle; likewise the Oxmoor and Alice stacks.

General Machinery.

The Stokes-Everhart Machine Works, Thomasville, N. C., recently incorporated, is establishing a plant for the manufacture of special woodworking machinery and tools, and will also deal in new and rebuilt woodworking machinery, mill supplies, &c. C. T. Everhart is president; Edward Everhart, vice-president, and J. F. Stokes, secretary and treasurer.

Recent sales of the Crocker-Wheeler Company, Ampere, N. J., include two 1000-kw. alternating current generators, Nordberg Mfg. Company, Milwaukee, Wis., to be installed in the plant of the Miami Copper Company, Globe, Ariz.; 800-kw. direct current generator, Houston Electric Company, Houston, Texas; two alternators, municipal plant at Pasadena, Cal.; motor generator set of 300 kw. capacity, Boise Valley Railway Company, Boise, Idaho; 100-kw. generator, Charles Wouter, Chicago, Ill.; 100-kw. generator, Timken-Detroit Axle Company, Detroit, Mich.; 200-hp. motor, Hunt Engineering Company, Des Moines, Iowa; two 100-hp. induction motors, Boston & Corbin Copper & Silver Mining Company, Boston, Mass.; 275 hp. of motors, National Tube Company, McKeesport, Pa. This makes over 23,000 hp. of Crocker-Wheeler motors used by the National Tube Company at McKeesport for operating the saws and rolling mill machinery.

The Clarke & Baker Company, Ilion, N. Y., is to erect a new building for cabinet work, and as it is the intention to operate the plant by electricity a considerable number of motors will be required. The company has not yet decided just what elecrtical equipment it will install.

Batcheller, Clark & Batcheller, New York, dealers in machinery and supplies, have made an assignment for the benefit of their creditors.

The Payne & Joubert Machine & Foundry Company, Birmingham, Ala., have recently increased their capital stock to $400,000 and have taken over the business conducted at New Orleans, La., by Payne & Joubert. The two plants are controlled by the same interest, and by consolidating them the company will be in a better position to manufacture machinery, castings, &c. The general offices will be in New Orleans and the business will be under the same management as heretofore. W. E. Payne is president; Fred L. Joubert, vice-president and treasurer, and R. S. McKnight, secretary.

William Webb and D. J. Broderick of Gloversville, N. Y., have entered into partnership and will open up a machine shop at 30 West Fulton street about June 1. Mr. Webb was formerly a member of the firm of Webb & Hildreth, machinists. The firm will engage in a general jobbing and repair business.

The Ramapo Iron Works Company, Buffalo and Iroquois streets, Niagara Falls, N. Y., with a New York office at 30 Church street, is negotiating for a site at Niagara Falls, Ont., on which it contemplates erecting a Canadian branch factory.

The shops of the Rio Grande Machine & Mfg. Company, Brownsville, Texas, have been purchased and will be operated by G. S. Cook & Son under the title of the Rio Grande Machine Shop.

Foundries.

James M. Riley, secretary of the Board of Contract and Supply, Troy, N. Y., will receive bids until May 21 for 125 tons of 8-in., 10 tons of 6-in. cast iron pipe and 2 tons of special castings.

The new steel casting plant to be erected by the Salt Lake Engineering Works, Salt Lake, Utah, will be operated in conjunction with the company's iron foundry and will cost about $50,000. The company will use the acid open hearth process, which, with its modern pattern and machine shop, will enable it to produce a good line of steel castings.

The Sternburg Supply & Foundry Company, Asheville, N. C., has incorporated under the same name. S. Sternburg is president and W. F. Post general manager.

The Central Foundry Company made its first casting in its reconstructed plant at Anniston, Ala., May 5. This plant, which was destroyed by fire March 7, was rebuilt in what is believed to be record time. April 1 the first timber was raised toward reconstruction and in about one month the following buildings were completed: Main foundry, 150 x 530 ft.; cupola house, 60 x 84 ft.; cleaning room, 46 x 94 ft.; blower and air compressor room, 17 x 40 ft.; engine room, 18 x 54 ft.; boiler room, 26 x 36 ft.; machine shop, 36 x 60 ft.; pattern and carpenter shop, 32 x 36 ft.; supply storage house, 21 x 55 ft.; assorting shed, 26 x 106 ft.; finishing material shed, 110 x 170 ft.; ladle house, 18 x 20 ft.; blacksmith shop, 14 x 15 ft.; tarring oven, 12 x 37 ft., and office building, 28 x 28 ft.

The A. B. Stove Company, Battle Creek, Mich., will build a new plant, consisting of foundry, finishing, storage and power buildings of reinforced concrete, brick and steel.

Power Plant Equipment.

Among the Western power plant contracts recently let was one secured by the Thompson-Starrett Construction Company, which calls for the erection of a sub-station at Oakland, Cal., for the Great Western Electric Power Company, and another, including the construction of a power house and the installation of equipment for the State Normal School at San José, Cal., has been taken by the Rickon-Ehrhart Company, San Francisco.

It is stated that work upon improvements of the hydro-electric power plant operated by the White River Light & Power Company, Columbus, Ohio, on the White River at Noblesville, Ind., which on account of the weather was suspended last December, will shortly be resumed. These improvements include the erection of a power house, turbine house and dam—the two structures first named being nearly completed and foundations for the dam almost finished. For the prosecution of this work a bond issue of $150,000 has been authorized, of which $100,000 has been offered and partly sold.

The city of Crockett, Texas, has arranged for a bond issue of $25,000 for the purpose of constructing a new water works. As soon as plans have been approved bids on the equipment and material required will be called for.

An application for a franchise for a water works system, electric light plant and sewer system has been filed with the town council of Bettendorf, Iowa, by the Bettendorf Improvement Company. Steps will be taken for the immediate installation of these improvements as soon as the franchise is granted.

The Hydraulic Properties Company, Providence, R. I., has given the exclusive agency for the construction of the Ransom & Hoadley reinforced concrete dams to Frank B. Gilbreth, 60 Broadway, New York.

The town council of Skuykill Haven, Pa., will receive bids until May 31 for a 300-hp. engine, 200 hp. boiler and a 200-kw. dynamo for the municipal light plant.

The Board of Public Works, Gaffney, S. C., will receive bids until June 1 for the construction of a complete water works system, including a pumping station, pumps, filter plant, stand pipe, water pipe, hydrants, valves, &c.

The Town Council of Clearwater, Fla., will receive bids until June 1 for the construction of a water works system and sewers. Specifications provide for either a steam or gasoline plant.

The Corporation of Basic City, Va., will erect a hydro-electric light and power plant and desires bids for the construction of a concrete dam, excavation work, construction of power house and machinery.

The Geneva, Waterloo, Seneca Falls & Cayuga Lake Traction Company, Seneca Falls, N. Y., will soon start construction on an auxiliary power plant at Cayuga Lake Park. The equipment for the plant will include boilers, one 200-kw. generator and one 300-hp. engine.

Fires.

No. 1 shop of the Bethlehem Steel Company, South Bethlehem, Pa., was damaged by fire May 16.

The Cambridge Electric Light Company's plant at Cambridge, Neb., was burned May 13, the loss being about $10,000.

The plant of the British Canadian Smelter Company at Chippewa, Ont., near Niagara Falls, was destroyed by fire May 15. The loss is about $50,000. It is expected that the plants will be rebuilt on a larger scale.

Bridges and Buildings.

The Bayley Structural Iron Company, Milwaukee, Wis., has taken out a permit for building a new plant in the vicinity of the Northwestern Malleable Iron Company's works.

The wooden building at present used by the Malleable Iron Range Company, Beaver Dam, Wis., for its nickeling and polishing departments will be replaced by one of mill construction, 60 x 170 ft., two stories high.

New car barns, with repair equipment, will be built this summer by the Grand Forks Street Railway Company, Grand Forks, N. D.

Hardware.

The Diamond Tack & Nail Works, Raynham, Mass., has been incorporated with a capital of $16,000. D. F. Ranney is president of the corporation; C. B. Gardner, secretary, treasurer and selling agent, and G. P. Leonard, superintendent. Mr. Gardner has been connected with the business for over 30 years, and Mr. Ranney for about 20 years. It is stated that the business was never in a more flourishing condition.

The Schatz Hardware Mfg. Company, manufacturer of hardware specialties, Chappaqua, N. Y., has purchased a site at Poughkeepsie, N. Y., and is having plans prepared for the construction of a new plant. The plant will consist of two buildings, one story, 80 x 260 ft., steel truss roof and brick curtain wall construction.

W. C. Shinn, Lincoln, Neb., maker of copper cable lightning rods and X-ray machines, has distributed three carloads of goods this spring in Northwestern territory through his warehouse

connections, the Security Warehouse Company, Minneapolis, Minn.

The Strubler Computing Scale Company, Elkhart, Ind., has increased its capital stock from $50,000 to $100,000.

Miscellaneous.

The Refractory Fire Brick Company, Washington, Pa., has been granted a Delaware charter to manufacture, sell and deal in firebrick, sand, lime, &c., with a capital stock of $300,000.

W. W. Slack, president, and H. K. Parkman, secretary and treasurer of Gilman & Son, Inc., Springfield, Vt., and G. C. Parker, sales manager of the William J. Smith Company, New Haven, Conn., have formed a partnership for the manufacture of abrasive metal cutters under the name of the Slack Mfg. Company, with headquarters at Springfield, Vt. All of the partners are to retain their present positions with their respective companies.

The Owen Motor Car Company, Janesville, Wis., has increased its authorized capital stock from $30,000 to $50,000. An extension to the factory is now under way.

In the recent item in these columns concerning the new steel barrel plant to be erected at Earl street and the Lake Shore Railroad tracks, Toledo, Ohio, the name of the company was incorrectly given. The plant, which will be 40 x 200 ft., will be erected by the Metallic Barrel Company, whose headquarters are in the Corn Exchange Building, Chicago, Ill.

Extensive improvements to its sewage system are to be undertaken by the city of Minneapolis, Minn., under authority recently granted by the State Legislature. This will involve contracts for machinery, iron pipe, valves, &c., in considerable variety.

The Petral Motor Car Company has removed to Milwaukee from Kenosha, Wis., and will occupy a plant to be remodeled for it.

The Keystone Ornamental Iron Company, established two years ago at 128 Sixth avenue, Homestead, Pa., has incorporated under Pennsylvania laws and has increased the efficiency of its plant. It is now in a better position to handle a larger amount of business in the line of fire escapes, iron stairways, fences, railings, &c.

Bids are being asked for by the village of Silvis, Ill., for the construction of a standpipe of 350,000 gal. capacity.

The Collier-Clark Construction Company, Coffeyville, Kan., has purchased the stock of the Stevans Electric Company, but will continue business under the name of the Stevans Electric Company.

The Van Buren Tool Company, Van Buren, Ind., recently incorporated with a capital stock of $25,000, will manufacture combination bolt and thread cutters, ratchet wrenches, carpenters' vises, saw clamps, molders' bellows, &c. R. A. Redding is secretary.

The Hercules Buggy Company, Evansville, Ind., is installing a central electric power plant of 500 hp. capacity, for the operation of four associated industries of which it is a part. A new building is being erected which will be supplied with a water tube boiler and Corliss engine. Current will be distributed to the various departments where motors will be used for driving the machinery. This interest is also building a wheel plant to turn out about 50,000 sets of wheels a year.

The Century Mfg. Company, New York, has leased a manufacturing site at Ogdensburg, N. Y., and has opened offices in the Hannon Block. The company is engaged in the manufacture of gas stoves and will operate a branch factory at Ogdensburg for the manufacture of motor boat specialties.

The Mica Insulator Company, Schenectady, N. Y., has taken over the plant and good will of the Eugene Munsel Company, 68 Church street, New York. Both companies are engaged in the manufacture of insulating material used in the manufacture of electrical goods. Architect and engineer W. L. Stoddart, 31 Union square, New York, has had plans under way for some time for a six-story fireproof plant to be erected at Schenectady for the Mica Insulator Company, but it is not determined whether the new plant will be built.

The Textile Machine Company, Jamestown, N. Y., has been incorporated by Gust Hultquist, David Harrison, Anton Bergren, Joseph Trainor and John J. Trainor to manufacture textile machinery.

The Buffalo Vent Company has been incorporated at Buffalo, N. Y., with a capital stock of $12,000, to manufacture ventilators. E. Floyd Branch, 188 St. James place, is president.

The Planhard Mfg. Company has been incorporated at Kokomo, Ind., with a capital stock of $15,000, to do an auto accessory manufacturing business. The directors are F. L. Kingston, Charles H. Felske, William D. Parr, Benjamin F. Harness and W. R. Voorhis.

The Custer Mfg. Company has been incorporated at Marion, Ind., with $12,000 capital stock, to manufacture automobiles. The directors are Burr Custer, Robert J. Custer and George D. Custer.

The National Coning Machine Company has been incorporated at Indianapolis, Ind., with $1,000,000 capital stock, to manufacture machines for making paper milk bottles and similar articles. The directors are William A. Scott, Alfred C. Wood and Murat W. Hopkins.

The Brazil Factory Promoting Club has signed a contract with the Knight-Brinkerhoff Piano Company, Charlotte, Mich., to move its plant to Brazil, Ind. The company is to erect a main building of brick, with 100,000 sq. ft. of floor space; a foundry with 50,000 sq. ft. of floor space, kilns, power house and other buildings. It is to give employment to 300 men.

The United Indurated Fibre Company, controlled by the H. W. Johns-Manville Company, will at once make large additions to its already extensive plant at Lockport, N. Y., expending, it is stated, several hundred thousand dollars in new buildings and equipment, including a large number of special presses. The United Indurated Fibre Company manufactures domestic hollow ware specialties, tubs, sinks, &c., and cold storage insulation.

The Lumen Bearing Company, Buffalo, N. Y., will build a brick and steel foundry addition to its plant at Sycamore street and the New York Central Railroad.

Canadian Bounty Prospects.

TORONTO, May 15, 1909.—Manufacturers of pig iron and steel ingots are still without information as to the chances of the bounties being renewed when the time for their expiration arrives at the end of the next calendar year. In reply to a question put to him in the House of Commons the Finance Minister said that the Government has not felt able up to the present time to recommend additional bounties. This somewhat Delphic statement leaves the interests concerned still guessing. What the Government does not now see its way to do it may clearly discern to be its duty in the better light of next year. It has been thus with the same problem at other times. The Government was never able to anticipate its action in respect to the continuance or discontinuance of bounties, and usually gave advance answers discouraging to those looking for a renewal. The event, however, always turned out to their liking. It may do so this time, though the public is unquestionably tired of the bounty system. It has failed of the purpose for which it was adopted. It has not promoted the development of the country's iron ore resources. The great bulk of the country's iron and steel output is the product of imported ore, taken from the mines of Minnesota and of Newfoundland.

Besides failing to stimulate the working of the country's resources of iron ore, it has proved extremely costly. In the fiscal year ending March 31, 1908, there was paid out on account of iron and steel bounties the large sum of $2,303,152.35. What makes this burden the more objectionable is its addition to the public debt, for the bounties are charged to capital account, and do not come out of current revenue. As the public debt is now going up by leaps and bounds as a result of the Government's construction of the National Transcontinental Railway and of deficits in the operation of the Government's Intercolonial Railway, while revenue shrank sharply within the last twelve-month, the idea of subsidizing the iron and steel industries does not grow in popularity. Another cause that the people have for wearying of them is the expansion of the Dominion Iron & Steel Company's export business. It is argued that if the company can afford to ship rails to India and Australia, sold against the keen competition of British, German and Belgian makers, it can afford to make rails for this protected home market without the assistance of Government bounties.

If Mr. Fielding renews the bounties, it will be in the face of a very strongly massed popular opposition, as distinct from a merely party opposition. Possibly the Conservative leader and the majority of his followers in the House would not be antagonistic to a renewal. Mr. Burden, the opposition chief, is a Nova Scotia man, and it is to his party that the country is indebted for the bounty system. At the same time it is by no means probable that Mr. Fielding would have the support of the conservative side for the concession of another five years' term of bounties. The people are so hostile to the system that it would be bad party politics for a leader to make himself conspicuous by advocating a renewal.

C. A. C. J.

The Iron and Metal Trades

The expected advance in the prices of wire came promptly, the volume of business booked at the cut rates having been very heavy. Wire rods were restored to $29 for Bessemer, after having been at $27 for a brief period.

The demand has been broadening in all finished lines and the market is stiffening, a firmer tendency having developed even in fabricated structural material in which very close figuring was being done.

Very cheering news comes from one great industry which has been suffering seriously for a long time, the seaboard shipbuilders. During the past few weeks they have been asked to figure on upward of a dozen boats, including three large steamers for the American-Hawaiian Line, which will probably be contracted for in a few weeks. This will bring welcome work to the plate mills. There is an inquiry in the market for 10,000 to 12,000 tons of plates for a riveted pipe line for an Arizona copper company. The order for 190 miles of 8-in. rifled pipe for California was placed with an Ohio producer.

A multitude of moderate sized orders for structural material are being placed and there is some large work still pending. Occasional fair car orders are also cropping up, the latest being 500 cars for the Chesapeake & Ohio road.

Chicago mills are getting the bulk of the steel rail business. The latest sales include 10,000 tons for the Soo Line and 5000 tons for the Northern Pacific. Inquiries under consideration are an additional 40,000 to 50,000 tons for the Harriman lines, 10,000 tons for the Chicago & Alton and close to 50,000 tons for the Gould roads. The bulk of the latter is likely to go to the Pueblo mill. In the East the Pennsylvania Steel Company has booked 9000 tons for the Bangor & Aroostock road. The report that the Argentine order for about 50,000 tons had been placed is premature. The red tape has not yet all been unwound.

The most interesting development in the pig iron trade has been the movement in basic pig iron in eastern Pennsylvania and the Atlantic Coast. Sales during the week aggregate fully 60,000 tons and amount thus far in the movement to fully 75,000 to 80,000 tons. Three sellers participated in this tonnage, while all the principal open hearth plants have contracted for metal, one of them taking between 20,000 and 25,000 tons, another 12,000 tons and a third 10,000 tons. The price realized was $15 delivered. Sellers now, however, are asking an advance of 25c. to 50c.

There have also been some round sales of low phosphorus pig, including one lot of 5000 tons. The volume of sales of foundry iron has also been quite satisfactory and Lehigh and Schuylkill Valley furnaces are stiffer, some of them asking an advance of 25 cents for the third quarter and 50 cents for the fourth quarter.

Under the impetus of a 30,000-ton inquiry in the Chicago District, and a like tonnage required for an eastern Pennsylvania plant, melting scrap has stiffened materially. In fact, the market for old material has advanced all along the line.

The copper trade has quieted down, and there are indications that second hands are trying to secure profits on purchases made before the advance.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May19, 1909.	May12, 1909.	Apr.21, 1909.	May20, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$16.75
Foundry No. 2, Southern, Cincinnati	**14.50**	14.50	14.25	14.75
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.60
Basic, delivered, Eastern Pa.	15.00	15.00	15.00	16.00
Basic, Valley furnace	14.00	14.25	14.00	15.00
Bessemer, Pittsburgh	**15.90**	15.90	15.65	16.90
Gray forge, Pittsburgh	14.40	14.40	14.40	14.90
Lake Superior charcoal, Chicago	19.50	19.50	19.50	20.00
BILLETS, &c., Per Gross Ton:				
Steel billets, Pittsburgh	23.00	23.00	23.00	28.00
Forging billets, Pittsburgh	25.00	25.00	25.00	30.00
Open hearth billets, Philadelphia	*24.50*	24.50	25.40	29.20
Wire rods, Pittsburgh	29.00	27.00	29.00	35.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**14.00**	14.00	13.50	12.00
Steel rails, melting, Philadelphia	**15.25**	14.75	13.25	12.75
Iron rails, Chicago	**16.50**	16.50	16.25	14.75
Iron rails, Philadelphia	**18.00**	17.50	17.00	17.00
Car wheels, Chicago	**14.75**	14.75	14.50	13.00
Car wheels, Philadelphia	**15.00**	14.50	14.00	14.00
Heavy steel scrap, Pittsburgh	**15.25**	14.25	14.00	12.75
Heavy steel scrap, Chicago	**13.75**	13.00	12.50	10.50
Heavy steel scrap, Philadelphia	**15.25**	14.75	13.25	12.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	**1.40**	1.40	1.37	1.45
Common iron bars, Chicago	**1.30**	1.27½	1.27½	1.65
Common iron bars, Pittsburgh	1.30	1.30	1.30	1.50
Steel bars, tidewater, New York	**1.36**	1.36	1.26	1.76
Steel bars, Pittsburgh	**1.20**	1.20	1.10	1.60
Tank plates, tidewater, New York	**1.46**	1.46	1.41	1.86
Tank plates, Pittsburgh	**1.30**	1.30	1.25	1.70
Beams, tidewater, New York	**1.46**	1.41	1.41	1.86
Beams, Pittsburgh	**1.30**	1.25	1.25	1.70
Angles, tidewater, New York	**1.46**	1.41	1.41	1.86
Angles, Pittsburgh	**1.30**	1.25	1.25	1.70
Skelp, grooved steel, Pittsburgh	**1.30**	1.25	1.20	1.55
Skelp, sheared steel, Pittsburgh	**1.40**	1.35	1.30	1.65
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh	*1.70*	1.60	1.85	2.05
Cut nails, Pittsburgh	*1.65*	1.60	1.70	1.90
Barb wire, galv., Pittsburgh	*2.00*	1.90	2.30	2.50
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.25**	13.25	12.87½	13.00
Electrolytic copper, New York	**13.00**	13.00	12.62½	12.87½
Spelter, New York	**5.15**	5.10	5.07½	4.60
Spelter, St. Louis	**5.00**	4.92½	4.95	4.50
Lead, New York	**4.35**	4.30	4.25	4.25
Lead, St. Louis	**4.30**	4.25	4.20	4.12½
Tin, New York	*28.80*	29.25	29.55	30.30
Antimony, Hallett, New York	7.75	7.75	8.00	8.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb. New York	$3.64	$3.64	$3.64	$3.89

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.30c., net; I-beams over 15 in., 1.35c., net; H-beams over 8 in., 1.45c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.25c., net; angles, over 6 in., 1.35c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.45c., base, half extras, steel bar card; tees, 3 in. and up, 1.25c., net; zees, 3 in. and up, 1.25c., net; angles, channels and tees, under 3 in., 1.20c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.60c., net; hand rail tees, 2.70c., net; checkered and corrugated plates, 2.70c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.30c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c. Box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Galvanized sheets, Nos. 13 and 14, 2.30c.; Nos. 15 and 16, 2.40c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.35c.; No. 30, 3.60c. Painted roofing sheets, No. 28, 1.55c. per square. Galvanized roofing sheets, No. 28, 2.80c. per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, 4½ to 8 in., are 78 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel.
1 to 1¼ in.	50
1¾ to 2¼ in.	62
2¾ to 3 in.	70
2½ in.	64
6 to 13 in.	62
2¼ in. and smaller, over 18 ft. long, 10 per cent. net extra.	
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.	

Wire Rods.—Bessemer rods, $29; chain rods, $29; basic rods, $29 to $30.

Chicago.

FISHER BUILDING, May 19, 1909.—(*By Telegraph.*)

The slowly rising volume of business in finished materials has been swelled to a marked extent by heavy buying in the past two weeks. Within that time a large amount of tonnage in rails, plates, structural shapes and steel bars has been entered by the mills, which are better provided with orders and are operating to fuller capacity than at any time since the panic of 1907. To the more liberal buying in these lines has been added a fortnight of exceptional activity in wire and wire products. The extreme low prices established by the recent decline in wire prices, coupled with the intimation of early reaction, brought out an extremely heavy demand. A very large part of estimated requirements for the spring trade was covered in orders placed since the first of the month, and the buying probably included the purchases of some large stocks in anticipation of higher prices later on. The predicted rise came a little sooner than was generally expected, as it was announced on Monday of this week by the American Steel & Wire Company that, effective May 15, prices were advanced $2 a ton. The late advance to 1.20c. on steel bars and 1.30c. for structural shapes and plates, Pittsburgh, is generally accepted as the ruling price basis, with the exception that in some cases Western mills base Chicago prices on a 15c. instead of an 18c. differential. While there is decided improvement in nearly every branch of the iron and steel industry, there is some apprehension lest over enthusiasm may result in a pace too rapid for substantial growth, for it is certain that in order to maintain a stable equilibrium consumption must keep pace with production.

Pig Iron.—From all reports there is less doing in pig iron in this market than in others East and West. Last week brought out nothing but a few scattered lots of small size. Seemingly consumers' wants are pretty well supplied, since inquiries have dropped off, and melters generally are manifesting little interest in the market. Southern makers are now pretty evenly lined up, at $11.50, Birmingham, for third quarter, with a few interests asking $12 for fourth quarter. It is not unlikely, however, that on attractive tonnage for prompt shipment $11 might be done, although this price is not being openly offered. Northern furnaces have not altered their position respecting values and are still asking $16 at furnace; at the same time this price is not being maintained with rigid firmness, as shading, to the extent of switching charges at least, is possible on some local deliveries. Sellers predict a dull market for several weeks to come, the period of inactivity depending to a great extent upon the rate of increase in consumption. Madeline Furnace, at Indiana Harbor, which was blown out for relining April 1, after a run of 19 months, was started again on Friday, May 14. Through an error the price of malleable Bessemer was wrongly quoted in last report, no change from the former quotation, which is here repeated, being intended. Th following quotations are for May and June delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.00 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.35 to 15.85
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	14.35 to 14.85
Southern mottled	14.10 to 14.60
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %	21.90 to 22.40

Rails and Track Supplies.—The rail orders booked last week by the Illinois Steel Company included another lot of 10,000 tons for the Soo Line and 5000 tons for the Northern Pacific. Inquiries from the Harriman lines for 40,000 to 50,000 tons and 10,000 tons from the Chicago & Alton are under consideration, the sale of the latter being practically concluded. Other purchases in sight bring the prospective tonnage in the market close up to 100,000 tons. At the South Works, No. 1 rail mill, rolling heavy sections, is running near 55 per cent. of capacity, while the Gary mill is turning out about 20 per cent. of its rated tonnage. At this rate, however, the latter mill has orders enough to keep it going for several weeks. There is also a possibility that some of the Bessemer specifications on a recent order of 15,000 tons may be changed to open hearth and the rails rolled at Gary. The light rail mill at the South Works is on this week, but is not booked very far ahead. Little business is being taken at the new prices, which are based on $26 for 40 to 45-lb. sections, Chicago. Whether this advance will be sustained by the prevailing upward trend is too early to determine. Some new orders for track fastenings are being placed and specifications are fairly satisfactory.

(*By Mail.*)

Billets and Rods.—No transactions of noteworthy importance are reported, the business done in forging billets last week being confined to a few small lot orders. We are advised, however, that the market is beginning to develop more strength, and $26, Chicago, for forging billets is being held with a little more firmness. Specifications for wire rods are coming out freely, but not much new business has been entered at the new prices.

Structural Material.—The effectiveness of the extreme low prices lately offered, in bringing out orders, is attested by the large amount of tonnage accumulated by the mills, both in contracts and specifications. Of the latter, the structural mill at the South Works of the Illinois Steel Company has enough to assure its full operation for 60 days ahead, at least, while its bookings are equal to its capacity well through the remainder of the year. In order to relieve this plant of some of the lighter shapes, it is likely that the Bay View mills, which now roll beams and channels up to 5 in., will be equipped to roll up to 6 and 7 in. in these shapes. The urgency for shipments is increasing, and deliveries are beginning to lag a little so that earlier than two weeks is not always available. The general quotation of all mills is now evenly lined up on a basis of 1.30c., Pittsburgh, although upon shipments from local mills the full freight differential of 18 cents from Pittsburgh is not strictly maintained. Included in the fabricating contracts taken last week are 9000 to 11,000 tons, placed by the Western Gould lines with the McClintic-Marshall Construction Company, which also secured 600 tons of bridge material from the Rock Island Railroad, the remainder, 18,000 tons, going to the American Bridge Company; 1000 tons for the Jefferson Building, Peoria, which went to Richards-Noelke Company, Indianapolis; 500 tons for the Des Moines, Iowa, Coliseum, the general contract for which was taken by the Gray Construction Company, St. Louis, and a lot of 114 tons for an apartment building let by the Covey Investment Company, Salt Lake City, Utah. Among the new inquiries reported are 2000 tons for a proposed building to be erected by the Isham Estate, Chicago, and 800 tons for a building upon which figures are being taken by the Ward-Corbey Company, Chicago. The Peoria & Pekin Union Railway, Peoria, Ill., is taking figures on material for a new drawbridge over the Illinois River at that place, for which 1200 to 1400 tons will be required. The fabricating shops are fairly well filled, and

the bidding on recent contracts seems to indicate a somewhat more firmer attitude respecting prices.

Plates.—Structural orders continue to supply the largest proportion of the plate tonnage coming to the mills, but the general demand from other sources, except the car shops, is slowly increasing. Specifications against recent contracts are being offered freely, and the demand for prompt shipment is becoming more insistent. It is understood that Bethlehem shapes will be used in the construction of the underframes for 1500 refrigerator cars recently ordered from the Pullman Company by the Harriman lines; the underframes will be furnished by the Bettendorf Axle Company. The price of 1.30c., Pittsburgh, now represents the general market as expressed in quotations of the various mill interests. The tendency to recognize an arbitrary differential of 15c. as between Pittsburgh and Chicago would likely make 1.45c., Chicago, possible.

Bars.—As a result of the heavy buying movement of the past few weeks, during which a heavy tonnage of steel bars was entered by the mills for shipment up to January 1, with some contracts running through the first half of next year, there is lessened activity so far as new orders are concerned. Buyers, however, are specifying freely. Some belated business is being booked at 1.20c., Pittsburgh, which is the price now asked by all of the mills. The demand for bar iron shows but little, if any, improvement, and while 1.30c. is the nominal market quotation, it is still subject to some shading.

Sheets.—Although lacking the stimulus afforded by the extremely low prices reached in some other mill products, the demand for sheets continues fairly good. Jobbers are buying with more confidence, and are less inclined to limit their orders to the bare necessities of current requirements. The heavier gauges of both black and galvanized sheets, which until recently were relatively dull, are moving more readily. The Atlanta Sheet & Tin Plate Company, which, pending arrangements for its supply of sheet bars, has been closed down for a couple of months, is taking orders for shipment subsequent to June 1, when it is scheduled to start up. Except for the slight shading of a few mills, prices are being fairly well maintained at the recognized schedule.

Merchant Pipe.—The business of the past week has developed nothing of significance excepting in so far as its slowly rising volume shows continued advance. From the number of inquiries received from jobbers, it is believed that there is a large amount of prospective business in sight, which will shortly come into the market. The active season for pipe work is now fully open, and general conditions seem to favor early betterment.

Boiler Tubes.—The market has not been stirred to activity by any increase of demand for either locomotive or merchant tubes. What buying there is is confined to small lots for immediate use.

Merchant Steel.—It is estimated that the greater part of the merchant steel tonnage in bars covering requirements up to July 1, 1910, has been booked, but there is still a good deal of business in miscellaneous shapes required by the implement makers still coming in. Contracts with jobbers, on such materials, have not, as a rule, been extended beyond October 1. Specifications from this source are fairly satisfactory, and the mills are more busily engaged than at any time in the past 18 months.

Cast Iron Pipe.—No large tonnages were included in the contracts for pipe let last week. One lot of 300 tons for Bimidji, Minn., was taken by the United States Cast Iron Pipe & Foundry Company. The award of 400 tons for East Grand Forks, Minn., is to be made early this week through contractors. All of the foundries of the leading interest are in operation at about 85 per cent. of capacity. A very satisfactory feature of the trade is the relatively large tonnage included in the routine orders outside of formal lettings. We quote, per net ton, Chicago, as follows: Water pipe, 4 in., $27.50; 6 to 12 in., $26.50; 16 in. and up, $25.50, with $1 extra for gas pipe.

Metals.—The development of a firmer tone in copper led to a more active demand, which resulted in the placing of considerable business. A number of the larger consumers came into the market with orders for one or more car lots. Lead also scored a slight advance, while spelter dropped back slightly. Old metals shared in the general forward movement both as to demand and prices, the leading grades showing an advance of from ¼c. to ½c. Quotations are as follows: Casting copper, 13⅛c. to 13¼c.; lake, 13⅜c. to 13½c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 31c.; small lots, 33c.; lead, desilverized, 4.35c. to 4.45c., for 50-ton lots; corroding, 4.60c. to 4.70c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; spelter, 5.15c. to 5.25c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¼c.; sheet zinc is $6.75, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¼c.; copper bottoms, 11½c.; copper clips, 12c.; red brass, 11¾c.; yellow brass, 9½c.; light brass, 7c.; lead pipe, 4¼c.; zinc, 4.75c.; pewter, No. 1, 21c.; tin foil, 23c.; block tin pipe, 26c.

Old Material.—The chief feature of interest in the market is the exceptional strength of all steel grades. For several months scrap dealers have been figuring upon a large increase in consumption of steel scrap, which was expected would result from the requirements of the Gary steel works when operations in this plant were fairly under way. Current rumors of a large inquiry from this source within the past few days were quickly reflected in a stiffening of prices. This move was further strengthened by the effort of several dealers to cover short sales on a considerable tonnage, the combined effect being to advance prices on steel scrap 75c. a ton. While it is conceded that eventually the Gary plant will become an important consumer of merchant steel scrap, even though it is compelled to go into the outside market for only a small percentage of what it will use, its present rate of consumption is not high enough to compel such action at this time. Although the rumors referred to have no confirmation, their effect upon the market is plainly felt. While mill scrap is practically stationary, with but little tonnage moving, the demand for cast scrap is increasing, and prices on this grade are slightly advanced. The amount of material offered in railroad lists coming out from week to week does not represent the holdings of the roads, since most of them have large tonnages in reserve. The Illinois Central Railroad is this week offering 4000 tons. The following prices are per net ton, f.o.b. Chicago:

Old iron rails	$16.50 to $17.00
Old steel rails, rerolling	14.75 to 15.25
Old steel rails, less than 3 ft	14.00 to 14.50
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheels	14.75 to 15.25
Heavy melting steel scrap	13.75 to 14.25
Frogs, switches and guards, cut apart	13.75 to 14.25
Mixed steel	10.50 to 11.00

The following quotations are per net ton:

Iron fish plates	$16.00 to $16.50
Iron car axles	17.50 to 18.00
Steel car axles	16.50 to 17.00
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	11.75 to 12.25
Springs, knuckles and couplers	12.25 to 12.75
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	10.00 to 11.00
Mixed busheling	7.50 to 8.00
Steel axle turnings	8.00 to 8.50
Machine shop turnings	7.00 to 7.50
Cast borings	5.50 to 6.00
Mixed borings, &c	5.25 to 5.75
No. 1 mill	7.00 to 7.50
No. 2 mill	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	13.25 to 13.75
Stove plate and light cast scrap	11.50 to 12.00
Railroad malleable	12.25 to 12.75
Agricultural malleable	10.75 to 11.25
Pipes and flues	9.00 to 9.50

St. Louis.

ST. LOUIS, May 17, 1909.

A cheerful feeling pervades the iron trade, and sentiment in coke interests is optimistic. The demand for structural and architectural iron and steel is gaining in volume, and supplies for the wagon and implement trades are in demand. Railroad circles, while speaking more hopefully, do not feel warranted as yet in going much beyond present actual requirements. Barring the tariff agitation and some uncertainty regarding crop conditions, business men do not name any hindrances of consequence to a gradual increase in the volume of trade, especially as money is plentiful, cheap and readily obtained on good collateral.

Coke.—While no large sales are reported, trade is fairly active, both for early and for future shipment. Several contracts have been secured for delivery up to July, 1910. With regard to prices, some say there is an improvement in the market, but, on the whole, things remain about the same, since, while production is increasing, on the other hand buying is better, there being more consumption. It is not reasonable to look for an advance, however, on account of production being still somewhat in excess of consumption. We quote f.o.b. Connellsville for standard brands of foundry coke for prompt shipment, $2; delayed shipment, $2.25.

Pig Iron.—The demand for pig iron has slacked up in some degree, especially from the larger buyers. The trade is not surprised or worried, since all the leading brokers have been favored with a very satisfactory volume of business during the past six weeks and regard the present lull as merely temporary. But three houses have had comparatively large sales for the week, the rest reporting a fairly good run of small orders. Of one leading Southern iron sales of 2300 tons are reported, of which 1700 tons were sold for shipment over the last half at $12, and 600 tons at $11.75, Birmingham, for shipment over the third quarter. Another house has sold 600 tons Southern, shipment over the last half; 500 tons Northern, shipment May-June; 300 tons Northern, shipment over second and third quarter. Inquiries are pending for quite a large tonnage from car building companies, including several hundred tons malleable Bessemer and Lake Superior charcoal. A third house has several inquiries aggregating 3000 tons, principally Northern and charcoal, ship-

ment over the last half. The leading sellers regard the market as firm with an upward tendency, and quote $11.50 as the price for No. 2 Southern foundry, early shipment; for shipment over the third quarter, firm offer of the same figure would be accepted by some brokers; for the last quarter, 1909, $12 is quite generally asked, Birmingham basis.

Old Material.—The feeling now prevailing among the principal dealers is in marked contrast to that which obtained not many weeks since. The belief in the development of an active and urgent demand from consumers is so strong that none of them is willing to make sales on the basis of previous quotations. The demand is mainly for foundry grades and to some extent for rolling mill stock. The only railroad list reported is the Wabash Railroad, of 700 tons. We quote per gross ton, f.o.b. St. Louis, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	13.50 to 14.50
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	13.00 to 13.50
Frogs, switches and guards, cut apart	13.00 to 13.50
Mixed steel	10.50 to 11.00

The following quotations are per net ton:

Iron fish plates	$13.00 to $13.50
Iron car axles	17.00 to 17.50
No. 1 railroad wrought	13.00 to 14.00
No. 2 railroad wrought	12.00 to 13.00
Railway springs	10.50 to 11.00
Locomotive tires, smooth	12.50 to 13.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings, &c.	5.50 to 6.00
No. 1 boilers, cut to sheets and rings	10.50 to 11.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	10.50 to 11.00
Agricultural malleable	9.00 to 9.50
Pipes and flues	9.00 to 9.50
Railroad sheet scrap	8.50 to 9.00
Railroad grate bars	9.25 to 9.75
Machine shop turnings	8.50 to 9.00

Lead, Spelter, Etc.—The strike situation in the Bonne Terre District remains unchanged. While there is a firm feeling, the demand for lead is ruling quiet. We quote for ordinary Missouri 4.25c.; refined, 4.30c. On account of a somewhat better demand and firmer views of smelters, spelter is held at 5c. Lead ore is selling at last week's figures and zinc ore is held at $38 per ton, Joplin, base. Tin is down 47½c. per 100 lb.; antimony is unchanged; copper is up ⅛c. Traffic in metals has ruled brisk the past week.

The Jefferson Iron Company, Jefferson, Texas, is the corporate name of a new iron company. A. P. De Camp is president; W. F. McClurg, vice-president; N. P. Withington, secretary and treasurer.

Cincinnati.

CINCINNATI, OHIO, May 19, 1909.—(*By Telegraph.*)

Routine of office and shop duty is enlivened this week in iron and steel circles with the entertainment of the numerous foundrymen and machinery folk in attendance at the American Foundrymen's convention. Many heads of great manufacturing plants are here, also representatives of pig iron houses covering the entire territory, and these, as a rule, look for a firm market on both iron and finished material, with a strong third quarter. The largest pipe interest, after a little lull, is again in the market for both iron and coke designed for its Louisville and Columbus plants, and this business is most likely to be negotiated in this market. The scrap dealers are advancing prices rapidly and looking for a continued stronger market.

Pig Iron.—Spot iron is weak, but there is still some buying for needs of the third and fourth quarter. Southern iron is unchanged and is rather firm, at $11.50, Birmingham, for delivery extending into the third quarter, some interests asking $12 for balance of the year, while others are willing to contract at $11.50 for the entire last half. There is talk of some $11 iron for May and June delivery, but any transactions on this basis are carefully guarded by both the customer and the seller. Iron from the Hanging Rock District is held firmly at $14.50 for No. 2 as minimum for any delivery prior to January 1. Some very good inquiries are being closed on malleable, charcoal and basic. The National Malleable Iron Company has bought between 3000 and 4000 tons, and, it is understood, at $14.50, Ohio furnace. A southern Illinois car works is in the market for 1000 to 1500 tons of different grades, malleable predominating, and some charcoal iron. Charcoal irons are selling well in this territory. A roll maker in the Pittsburgh District is buying 1000 tons, principally chilling grades; another 500 tons, the greater part of which, it is said, will come from the South. The contract price of this iron is reported at $19 to $19.50, with a freight rate of $4.90. The Northern charcoal iron is quotable at $18, at furnace. A scrap dealer is in the market for 4000 tons of basic, either Northern or Southern, on speculation, for delivery through the balance of the year. This dealer frequently buys on investment account. A sale to-day of 800 tons of Northern basic, delivery June to November, was made at $14.50, Ohio furnace. Furnaces seem disinclined to quote for the last quarter alone, and this is true of interests in both Northern and Southern producing territories. For early delivery and remainder of the year, f.o.b. Cincinnati, freight rates being $3.25 from Birmingham and $1.20 from the Hanging Rock District, we quote as follows:

Southern coke, No. 1 foundry	$15.00 to $15.50
Southern coke, No. 2 foundry	14.50 to 15.00
Southern coke, No. 3 foundry	14.00 to 14.50
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	15.00 to 15.50
Southern coke, No. 2 soft	14.50 to 15.00
Southern coke, gray forge	13.75 to 14.00
Southern mottled	13.25 to 13.75
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	22.25 to 23.25
Lake Superior car wheel	21.75 to 22.75

(*By Mail.*)

Coke.—The week has seen some very good sales of furnace grades and prices have not changed. It is thought that practically all Southern furnace interests are now contracted up for six months and a year. The Ashland Furnace interest, which was in the market last week for seven or eight months' supply, bought about 22,000 tons, and it is understood the price was a shade under $1.75, at oven. Foundry coke is getting stronger in this market, and some very good sales of Virginia grades are noted. Connellsville furnace brands are quotable as low as $1.50, and on contract $1.70 to $2; Connellsville 72-hr. foundry from $1.90 to $2.40, according to grade and averaging about $2.25 on contract. Wise County spot furnace grades are selling at $1.60 to $1.75; foundry, $2 to $2.25; Pocahontas Furnace, $1.75; foundry, $2 to $2.15.

Structural Material.—Aside from the talk of continued shading on the part of two independent interests, local sales agencies seem firm at 1.30c., Pittsburgh, for shapes and plates. Twisted steel bars for concrete work, of which there is a large amount in evidence in this district, are having an excellent sale. On Thursday, 20th inst., the Board of Directors of the Ohio Mechanics' Institute will meet for approval of the architects' plans for the erection of that building, for which $500,000 is available, after which the architects, Samuel Hannaford & Sons, will be ready for bids. It is to be a concrete building, but there will be needed between 800 and 1000 tons of structural material in the way of twisted bars, trusses, columns, girders, &c.

Bars and Sheets.—On steel bars the agencies are quoting for prompt shipment on a basis of 1.20c., Pittsburgh, or 1.35c., delivered Cincinnati. Most heavy users are reported bought up for the year, but there are some scattering sales. Business on iron bars, which has been light, is showing some improvement, recent sales having been mostly in small lots for immediate use. These are quotable at 1.40c. to 1.50c., delivered Cincinnati. Galvanized sheets are showing the best sales in this territory and are quotable on the basis of 3.25c. for No. 28 gauge. The Andrews Steel Company, which is finishing some important improvements and additions at its Newport, Ky., plant, expects to put in all 10 mills on May 24.

Old Material.—The leading dealers in scrap report an improvement in inquiry which seems to be general. Under the active demand prices have stiffened again, and some dealers are asking an advance of 50c. to $1 per ton over last week's prices. Some good sales are reported from Chicago, St. Louis and Pittsburgh territory, and these have averaged about $13, f.o.b. Cincinnati, for melting steel, which has led in demand. There is a wider range in dealers' asking prices, on melting steel and No. 1 railroad wrought the spread being as much as $1; for instance, $15 is quoted by one large interest on railroad wrought, while another's range is $13.50 to $14. Taking all facts into consideration, the following prices are given as about representative of the actual market and are f.o.b. Cincinnati:

No. 1 R. R. wrought, net ton	$13.50 to $14.00
Cast borings, net ton	6.00 to 6.50
Heavy melting steel scrap, gross ton	13.00 to 13.50
Steel turnings, net ton	8.50 to 9.50
No. 1 cast scrap, net ton	12.00 to 12.50
Burnt cast, net ton	9.50 to 10.50
Old iron axles, net ton	17.00 to 17.50
Old iron rails, gross ton	15.00 to 15.50
Old steel rails, short, gross ton	13.25 to 13.75
Old steel rails, long, gross ton	13.50 to 14.00
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton	13.50 to 14.00
Low phosphorus scrap, gross ton	14.00 to 14.50

The John H. McGowan Company, manufacturer of pumping machinery, hydraulic presses, brass goods, &c., reports its plant engaged on important municipal and other contract work, with full force on full time. Five important contracts on which it is now busy are water works plants for the cities of Lancaster, Ohio; Dyersburg, Tenn.; Corinth, Miss.; Itta Bena, Miss., and Huron, Ohio. In pumping capacity the engines aggregate 1,025,000 gal.

Pittsburgh.

PARK BUILDING, May 19, 1909.—(*By Telegraph.*)

Pig Iron.—Inquiries for pig iron in the past week have not been quite so active, but the market is firm and prices seem to be hardening. The Westinghouse Air Brake Company, which is in the market for 500 tons and upward of Bessemer and the same quantity of Northern gray forge, expects to close this business on Saturday. The specifications on the iron are regarded as somewhat severe, and some furnaces are not quoting on the inquiry. We quote Bessemer iron at $15; malleable Bessemer, $14.50 to $14.75; No. 2 foundry, $14.25; basic, $14 to $14.25, and gray forge, $13.50 to $13.75, all for prompt shipment and f.o.b. Valley furnace, the freight to Pittsburgh being 90c. a ton.

Steel.—Consumers are specifying more liberally on contracts for billets and sheet and tin bars, and shipments of steel by the mills are heavier than for some time. We quote Bessemer and open hearth billets at $23, sheet and tin bars at $25 and forging billets at $25 to $26, f.o.b. Pittsburgh.

(*By Mail.*)

The advance of $2 a ton in wire products effective May 15, and an advance of 50c. to $1 a ton in heavy melting steel, and slight advances in prices on other kinds of scrap, are the chief events in a fairly active week in the steel market. Trade all along the line is decidedly better, and the tone of the market is stronger. Some of the leading steel concerns are running to upward of 90 per cent. of capacity and few are operating below 75 per cent. When it is considered that these conditions exist with little buying by the railroads it can readily be seen that if they were taking even half their normal requirements the steel trade would be about as active as it could get. The pig iron market is more active and most sellers are asking higher prices. Consumers of billets and sheet bars are taking out more tonnage on their contracts. In finished lines of iron and steel the demand is broadening greatly, and the mills are entering more tonnage than at any time in the last year and a half. When the recent heavy cut in wire products was made the trade responded at once with such large orders that the mills were simply overwhelmed with business, and to check the active buying and not take on any more orders at the low rates, the advance was decided upon. In structural steel some heavy contracts have been placed, and concerns that a few months ago were doing very little now have a comfortable tonnage on their books and are firmer in their ideas as to prices. Sheets, tin plate, steel bars and pipe are quite active and prices are ruling firm. The scrap trade has shown much betterment both in demand and prices, and with the increased operations of the mills the consumption is much heavier. The coke trade is still lagging somewhat, but the demand is a little better, and it is believed that prices will soon improve.

Ferromanganese.—Reports are that a leading steel company is in the market for 1000 tons of ferro for forward delivery, and has been quoted as low as $40 to $40.50, seaboard. Local sellers are asking about $41, Baltimore, equal to $42.95, Pittsburgh.

Ferrosilicon.—This material for spot shipment is scarce, and as high as $65, Pittsburgh, is quoted for spot shipment. For delivery over the next three or four months 50 per cent. ferrosilicon is quoted at $61 to $62, Pittsburgh.

Rods.—An immense tonnage of rods was sold immediately after the price was reduced to $27, Pittsburgh, and nearly all consumers are now covered for some time ahead on this basis. It is probable that there will be very little open tonnage of rods in the market for some time. The advance of $2 a ton in wire products carries the price of Bessemer and chain rods to $29 and open hearth to $29 to $30, Pittsburgh.

Skelp.—The demand for both iron and steel skelp is more active, and prices are higher, especially on iron skelp. We quote grooved steel skelp at 1.30c. to 1.35c.; sheared, 1.40c. to 1.45c.; grooved iron, 1.50c. to 1.55c., and sheared iron skelp, 1.55c. to 1.60c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—The market on standard rails continues dull. Light rails are active, and in the past week the Carnegie Steel Company received new orders and specifications against contracts for 7000 tons, the heaviest business it has booked in any one week for over two years. One customer placed an order for 1500 tons, of which 800 are for immediate rolling, and the other 700 to be delivered in June. Rail fastenings are in good demand in the territory east of the Mississippi River. The Carnegie Company continues to make fairly large shipments of standard and light rails for export. We quote standard sections at $28, at mill, while prices on light rails recently adopted by a leading mill are as follows: 12-lb., $28; 16, 20 and 25 lb., $27; 30 and 35 lb., $26.75; 40 and 45 lb., $26, all in 250-ton lots, f.o.b. Pittsburgh. Over 250 tons and up to 500 tons, 60c. a ton less, and over 500 tons $1 a ton less.

Plates.—Some fairly large inquiries for plates are in the market, including a riveted pipe line for a copper company in Arizona, which will take from 10,000 to 12,000 tons. The material for two freighters, 6000 to 8000 tons, is in the market and will likely be closed in a short time. The demand from general consumers, such as boiler shops and others, is showing some improvement, and leading plate mills are operating now close to 75 per cent. of capacity. The market seems strong, and we quote plates, ¼-in. and heavier, for general run of orders, at 1.30c., but on a very attractive specification and for a large tonnage 1.25c. could still be done.

Structural Material.—A cheap money market and low prices for steel are bringing out a heavy volume of business, and while April was a record breaker in the matter of tonnage placed, it is believed that May will be still larger. The McClintic-Marshall Construction Company has taken 16,100 tons for the Philadelphia & Reading track elevation at Philadelphia, 8000 tons for the Missouri Pacific (and not 5000 tons as reported last week), and about 200 tons for a steel building for the Kinnear Mfg. Company, Columbus. The American Bridge Company has taken 750 tons for the Wilkinsburg High School and about 800 tons for new steel buildings for the Phillips Sheet & Tin Plate Company. The Massillon Bridge Company has taken 1300 tons for docks at New Orleans, and the Cambria Steel Company has taken 5500 tons for new steel buildings for the Inter-Ocean Steel Company at Chicago Heights. The contract for 5500 tons for the Boston & Albany elevated work at Boston will likely be awarded this week, and the Dominion Bridge Company has taken 4750 tons of elevated work for the Grand Trunk, at Cato, Ontario. Local work in the market includes 1200 tons for the West Penn Hospital and a new steel bridge at New Castle, Pa., about 300 tons. Several structural concerns that six weeks or two months ago had little on their books are now pretty comfortably filled and are firmer in their ideas as to prices for fabricating work. A great deal of other large work is in sight, much of which is expected to be placed before this month is out. The market on beams and channels up to 15-in. seems to be firm, at 1.30c., Pittsburgh.

Steel Bars.—Most consumers of steel bars, both large and small, have pretty well covered their requirements for the next six to eight months, while the implement makers have pretty well covered up to July 1 next year, and as a natural result new orders for steel bars are not quite as heavy now as they were two or three weeks ago. However, a fair amount of new business is being placed and specifications against contracts are coming in freely, with the result that the leading makers of steel bars are operating to 85 and 90 per cent. of capacity. The demand for iron bars is better than for some time, and the mills are much firmer as to prices. We quote steel bars at 1.20c. and iron bars at 1.30c. to 1.35c. at mill, f.o.b. Pittsburgh.

Tin Plate.—The demand for tin plate is quite active and specifications against contracts are coming in freely. Shipments of tin plate by the leading mills in April were the heaviest in any one month for more than a year. It is stated that the regular price of $3.40 on 100-lb. cokes is being maintained.

Sheets.—There is some improvement in the demand for sheets, and prices are firmer, but the mills could take care of a good deal more business than is being offered. The leading interest is operating to about 70 per cent. of available capacity, and this will shortly be increased. Some individual records for output of sheets were made in April at the Vandergrift Works and several other plants of the American Sheet & Tin Plate Company. We quote one-pass box annealed black sheets, No. 28 gauge, at 2.20c., and galvanized of the same gauge, 3.25c. The regular price of painted roofing sheets No. 28 is 1.55c. per square, and of galvanized No. 28 is 2.80c. per square for 2½-in. corrugations, but prices on the latter items are being shaded.

Hoops and Bands.—Prices seem to be a little firmer, and orders are more plentiful but are still confined to small lots to meet current needs. The nominal price of hoops is 1.60c., and bands 1.20c., with steel card extras on the latter, but these prices are shaded more or less, depending on the order.

Spelter.—The demand is rather dull, and prices are more or less nominal. We quote prime grades of Western at 4.90c., East St. Louis, or 5.02½c., Pittsburgh, but this price could be shaded on a firm offer.

Railroad Spikes.—There is more buying of spikes by

the railroads, but mostly in small lots to cover current needs, while specification against contracts are coming in quite freely. We quote railroad spikes at $1.60 to $1.65 for 5½ x 9-16 in., and $1.70 to $1.75, base, for the smaller sizes, in carloads and larger lots, 5c. per keg additional being charged for less than carloads.

Merchant Pipe.—Reports that the leading interest had taken a contract for 190 miles of 8-in. rifled pipe for the Associated Pipe Line Company of California are incorrect, this contract having been taken by the Mark Mfg. Company of Chicago, with mills at Zanesville, Ohio. The large projects in the market for pipe for gas and oil lines, referred to in this report several times, are developing but slowly, although it is expected several of them will shortly be placed. The general demand for merchant pipe continues active, and so far this month has shown a material increase over the corresponding period in April. The mills are particularly well filled up on the larger sizes of pipe. We are advised that regular discounts on both iron and steel pipe are being well maintained.

Boiler Tubes.—New orders in both locomotive and merchant tubes are light, and regular discounts are more or less shaded. Consumers are buying only in small lots to cover current needs.

Iron and Steel Scrap.—We can report a decided increase in activity in the scrap market, and prices on nearly all grades have advanced, heavy steel scrap being quoted fully $1 a ton higher than two or three weeks ago. While it is true that large stocks are piled up in the yards of various dealers in the different scrap centers, they are holding their scrap for higher prices, realizing that with a much heavier consumption their chances of getting better figures are very good. We are advised that within the past week or two some large deals for heavy steel scrap have been put through, three or four leading consumers having bought round tonnages. There is a decided increase in consumption, and dealers who have gone short of the market are finding trouble in making purchases to cover these shortages. We have advanced prices on nearly all grades of scrap and now quote as follows: Heavy steel scrap for Pittsburgh delivery, $15.25 to $15.50, and for Monessen, Sharon, Follansbee and Steubenville delivery, $15.75 to $16. Cast iron borings are higher, dealers now quoting $9.50 to $10; bundled sheet scrap, $11.50 to $12; No. 1 cast, $15 to $15.50; No. 2, $14 to $14.50; No. 1 railroad malleable, $14 to $14.50; sheet bar crop ends, $16.50 to $16.75; low phosphorus melting stock, 0.04 and under, $18.50 to $19; rerolling rails, $15.50 to $15.75; steel axles, $17.25 to $17.50; grate bars, $10.75 to $11; old car wheels, $15 to $15.50; locomotive axles, $22 to $22.50; locomotive tires, $17 to 17.50; machine shop turnings, $10.50 to $11; iron axles, $18.50 to $19; iron rails, $16 to $16.25, all in gross tons, f.o.b. Pittsburgh, unless otherwise stated. The Norfolk & Western list on scrap closes May 19, and bids that have gone in are at higher prices than have been made for some little time.

Coke.—Not much has been heard of the proposed coke merger in the past week, and reports are that much more difficulty is being experienced in trying to put this deal through than was expected. Inquiries for both furnace and foundry coke are better, and prices are a shade stronger. We quote best grades of furnace coke for prompt shipment at $1.55 to $1.60 per net ton, at oven, while other grades are offered at $1.50 a ton or lower. Two large inquiries for furnace coke are in the market for delivery over last half of the year, and several leading makers have quoted as high as $1.85 on these inquiries, and are not inclined to shade that figure. Best makes of 72-hr. foundry coke for prompt shipment are sold at $1.85 to $1.90, at oven, and on contracts for shipment over last half of the year from $2.15 up to $2.35 per net ton, at oven, is being quoted. The output of coke in the Upper and Lower Connellsville regions last week was 244,279 tons, an increase over the previous week of nearly 15,000 tons.

The Lawrenceville Bronze Company, Pittsburgh, recently appointed J. W. L. Kerr, Chicago, Ill., its agent in that territory for the sale of bronze and copper castings and railroad, rolling mill and blast furnace supplies.

Edgar T. Ward & Sons, Boston, Mass., are now receiving weekly shipments from England of their new steel, Ultra Capital. This is a water hardening steel especially adapted for fine finishing on very hard material. It is claimed to be stronger than standard high speed steel, and will not break in hardening.

The Dale Engine & Supply Company, Ltd., Franklin, Pa., has been succeeded by S. G. Milton & Son. The new firm will manufacture the S. G. Milton pulling machine, a description of which appeared in *The Iron Age* of April 8, and will continue the manufacture of portable cranes and gas engines.

Cleveland.

CLEVELAND, OHIO, May 18, 1909.

Iron Ore.—Some sales have been made during the week and the market is slowly growing better, although as yet it cannot be said to be active. While a number of contracts were closed, nearly all were for small tonnages. Specifications were also received from some consumers who have long time contracts. All sales have been made at last season's prices, which will probably be firmly maintained throughout the season. Ore firms are now figuring on the sale of considerable tonnage for which contracts will probably be closed in a few days, but there are many consumers who are not expected to come into the market until quite late in the season. Ore shipments from the docks are pretty slow for this time of the year. No important change has developed in the strike situation. The Lake Carriers' Association now has about 200 boats in operation, which is more than enough to take care of the available business at the present time. The State boards of arbitration of Ohio, Michigan and Illinois are to meet in Detroit to-day to discuss the strike, but the lake carriers will take no part in the conference. Ore prices at Lake Erie docks, per gross ton, are as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market has quieted down considerably. There were quite a number of sales of foundry iron during the week, but they were mostly small lots for last half delivery. We note the sale of one round lot of malleable iron, and the United Steel Company of Canton, which had an inquiry out last week for 6000 tons of basic, has placed its contract, a portion going to a Cleveland interest. A local agency reports the sale of considerable additional tonnage in the East, where the demand for foundry and malleable iron continues fairly good. Valley interests continue to hold pretty firmly at $14.50, at furnace, for No. 2 foundry iron for the last half, and some interests that are looking for better prices are now asking $14.75 to $15. Local furnaces are holding firmly to $14.50 for No. 2 for outside shipment, at which prices they are making sales, and in some cases are quoting $14.75. For Cleveland delivery they are getting $15.25, delivered. Basic is quoted at $14.25, Valley furnace, but this price could probably be shaded for early delivery. We quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.65 to 15.75
Northern foundry, No. 2	15.15 to 15.25
Northern foundry, No. 3	14.65 to 14.75
Gray forge	14.00 to 14.50
Southern foundry, No. 2	15.60 to 16.10
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—The market is quiet. Some foundries have made contracts for their last half requirements, but the majority are holding off. We quote standard furnace coke at $1.50 to $1.60, at oven, for spot shipment, and $1.75 to $1.90 on contract. Standard 72-hr. foundry coke is held at $1.90 to $2, at oven, for spot shipment and $2 to $2.25, on contract.

Finished Iron and Steel.—All the mill agencies report a good volume of specifications on contracts. Since the advance in prices few new contracts have been closed. While consumers are nearly all covered, a few are trying to secure contracts at lower than the current prices but without success. All the mills are holding firmly to 1.20c., Pittsburgh, on steel bars, and 1.30c., Pittsburgh, on plates and structural material. The leading interest is making no contracts for future delivery except for specific work, and some of the independent mills express no desire for additional contracts at the present time, and will not take them beyond October 1. Quite a number of the implement makers in this territory have not yet made steel bar contracts beyond July 1, and some of those that covered when lower prices were prevailing made contracts only to January 1. Specifications during the week were largely on short time contracts, the bulk of the tonnage being for steel bars. Good sized stock orders were received from local jobbers. The demand for structural material in small lots for building purposes continues good, and the demand for plates shows some improvement. There is now a good demand from the boiler makers. The Circuit Court has upheld the action of the County Commissioners in awarding the contract for the Denison-Harvard Bridge, 6300 tons, to the King Bridge Company, the award having been contested by the McClintic-Marshall Construction Company. The plain material will be furnished by the Lackawanna Steel Company. Bids were opened this week for two local buildings, the Brown Building, 1300 tons, and the Anisfield Building, 580 tons. The demand for sheets is only fairly active and prices are still being shaded. The demand for iron bars shows a slight improvement, and prices are a little firmer. Neither of the two local bar iron mills is in operation. We quote iron bars at 1.25c. to 1.30c., Cleveland. The Lake Shore Railroad has placed an order for 3800 kegs of spikes and some smaller orders for supplies have come from the railroads.

Old Material.—The market shows further improvement and prices are very firm. Owing to a scarcity, quotations on steel car axles have been advanced $2 a ton and a slight

advance is noted in some other grades. There is a fairly good demand for nearly all kinds of scrap, and mills are trying to contract for future deliveries at present prices. Dealers, however, refuse to sell at present prices, except for small lots for early shipmnnt. As a result no sales of round tonnages are reported. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	15.50 to 16.00
Steel car axles	19.00 to 19.50
Old car wheels	14.50 to 15.00
Heavy melting steel	14.00 to 14.50
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$17.00 to $17.50
Cast borings	6.50 to 7.00
Iron and steel turnings and drillings	7.50 to 8.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.50 to 12.00
No. 1 railroad wrought	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Stove plate	10.50 to 10.75
Bundled tin scrap	9.00

Birmingham.

BIRMINGHAM, ALA., May 17, 1909.

Pig Iron.—While no very large lots were reported sold during the week just closed, yet the producing interests feel more hopeful of continued and well sustained improvement in the iron market than they have for many weeks. It develops that without a doubt the buying during the past eight weeks, while it has been quietly done on the part of many consumers, has been much larger than generally supposed. Both large and small melters have been picking up iron from week to week, as they realized that the prices that prevailed were near the cost mark with many furnaces. Another feature of particular interest is that the buying has come from widely distributed sections. And all classes have been in the market. More recently a number of the railroads operating their own foundries have been purchasing, indicating a willingness on the part of their management to begin the rehabilitation of their equipment. Railroad lines in the South are making good showings as to earnings, and they generally expect a good movement of traffic with the beginning of the harvesting season. Foundries that bought last fall at higher prices than now prevail are beginning to send in requisitions against such unfilled orders, evidencing the improvement they are experiencing in their lines of work. When the tonnage remaining due on these old orders is taken into consideration, with the recent heavy sales of Southern iron, it is found that the Alabama furnaces have sufficient bookings for a steady run of about five months. This would certainly seem a sufficient justification of the belief that prices will remain firm, with an upward tendency, as other buyers come into the market from time to time. Prices are held at $11.50, Birmingham, for No. 2 foundry, and No. 2 soft, delivery running through September, while $12 is being asked and obtained for the last quarter. Furnaces are refusing to consider business for delivery into next year. Gray forge is still scarce and commands a premium, bringing within 25c. of the No. 4 foundry price. Irons of special analysis still bring quite a nice premium, some sales of such having been made the past week at $13.50, Birmingham. It is understood that a speculative inquiry for 10,000 tons was before the trade the past week, and that a firm offer of $11 failed to secure the iron. There will be still further curtailment of production this week, due to two more stacks going out of blast for repairs.

Cast Iron Pipe.—No new lettings of consequence developed with the pipe founders last week. It must be remembered that all the water and gas pipe producers of the South are very comfortably taken care of for some time ahead with orders, and they are not, therefore, so aggressive in their hunt for business as has been the case with other iron products. At the moment chief interest centers in the proposed issue of a regular tariff rate of $11 per net ton on cast iron pipe to Pacific Coast terminals. For some time a rate of about $13 per ton has been charged on both pig iron and pipe, the former being per gross ton, while the latter carried a rate per net ton. The pig iron rate has been recently reduced to $10 per ton to enable Southern furnaces to compete with foreign iron; and now the cast iron pipe people fear the establishment of foundries on the coast to take care of the business beyond the Rockies unless they are given a like rate on pipe. While a $10 rate on pipe is being asked for, it is understood generally that a rate of $11 would be satisfactory. With such a rate, the business on the Pacific coast should be materially stimulated, as it is argued that many of the smaller cities would immediately begin the putting in of better and more extensive gas mains, water works and sewerage systems. Quotations on water pipe, f.o.b. foundries, remain about as follows: 4 to 6-in., $25; 8 to 12-in., $24; over 12 in., $22 to $23; with $1 extra for gas pipe.

Old Material.—The shutting down of the Ensley plant of the Tennessee Coal, Iron & Railroad Company has had the tendency to produce a temporary lull in some lines of scrap. Car wheel makers are melting more old wheels, as they report an increasing demand for new wheels. Second-hand rails have had a little better demand from the coal mines, due to the fact that operators are taking advantage of the dull season in the coal business to make extensions of their development work so as to be ready for the improved demand that comes with the advent of the fall and winter months. Nominal quotations follow:

Old iron rails	$13.50 to $14.00
Old iron axles	14.50 to 15.00
Old steel axles	12.00 to 12.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.00 to 9.50
No. 2 country wrought	8.50 to 9.00
No. 1 machinery scrap	10.50 to 11.00
Tram car wheels	10.50 to 11.00
Old car wheels, standard	12.00 to 12.50
Stove plate and light cast	7.50 to 8.00
Cast borings	4.00 to 4.50

The German Iron Market.

BERLIN, May 7, 1909.

The latest reports from the American iron market, published by *The Iron Age*, a brief abstract of which is regularly cabled to the German press, have made a good impression on the stock market here, causing iron shares to be bought with considerable zest and at rising prices. Those reports, too, have been received in the German iron trade as an encouraging sign, where the strength of iron shares is interpreted as probably foreshadowing a betterment in the general state of business in the country. But the feeling is quite general in the trade that no good reason exists for booming the shares of iron companies.

Trade Still Unimproved.

The state of the trade remains exceedingly unfavorable, though a few cases have been reported latterly where business has slightly improved, or even where prices have been lifted a little. Comparing all the reports from the Rhenish-Westphalian and other districts, however, it cannot be said that business has improved since a month ago. All the reports are pitched in a very pessimistic key. Complaints are general of overproduction, ruinously low prices, sharp competition in nonsyndicated goods, and a very light run of new business. In some cases wages have latterly been reduced in order to cut down the costs of production and bring them more in keeping with the prices of iron products; and in the Siegen District the mills have quite recently reduced the hours of work. In general it may be said that the spring business has been very disappointing. The return of weather favorable for building operations, which had been looked forward to throughout the dull winter months with much hope, has thus far failed to affect any section of the market appreciably, and it is now too late in the season to expect any considerable change from that quarter.

The political situation since a month ago, both home and foreign, has not had a favorable effect in the iron market. The efforts of the Imperial government to get bills passed in the Reichstag to raise $120,000,000 of revenue by new taxation have not yet been crowned with success; and the situation is now clouded in extreme uncertainty. The long dragging out of the squabble between the political parties over the tax bills has tended toward intensifying the dulness of the iron trade. The settlement of the troubles between Servia and Austria and at other points in the southeast of Europe has also been attended with unhappy results for one section of the trade. Many orders for arms of various kinds, including artillery, have been canceled, and not a few shops have consequently suffered a considerable restriction in the volume of orders on hand.

The trade movement reflects the unfavorable position of the iron industry, showing that manufacturers are exerting themselves to increase their sales abroad to make up for the light demands of the home market. In March the exports of iron of all kinds reached 349,335 tons, and the excess of exports over imports was 317,829 tons—in both cases the largest figures for some years. The April figures are already available for a few special kinds of goods. These show exports of 37,700 tons of ingots, blooms and billets, against 27,300 tons in April of last year; 25,560 tons of beams, against 24,470; and 32,150 tons of steel rails, against 21,860 tons.

Ore and Pig Iron.

In the ore market conditions have rather grown worse than better. The furnaces are disposed to hold back orders as long as possible in the effort to compel the mining companies to give better terms; but many of the mines, it is said, are already operating at a loss and cannot make lower prices without ruining themselves. The competition of foreign ores is felt more intensely during this period of depression. Notwithstanding the light demand for iron, the imports of ores this year have been even heavier than last.

For the first three months imports amounted to 1,764,000 tons, which compares with 1,348,000 tons for the first quarter of 1908. The biggest gain was in the imports from Spain, which amounted 583,000 tons, against only 369,000 tons last year. The heavy imports continued in April, having reached 599,880 tons, against 591,180 tons in April, 1908. In the Minette ores of the Luxemburg-Lorraine district the sales of independent mining concerns are very light. The big iron companies there are developing more and more their own deposits of ores; hence the independent producers are finding their market growing narrower and narrower. Some of the big works are also bringing in increasing quantities of ores from their properties across the French frontier. The imports of French ores in the first quarter of the year rose to 282,000 tons, against 177,000 tons last year.

In the pig iron trade conditions vary considerably with the different classes of furnaces. Here, too, it is the independent concerns that are suffering most, whereas the furnaces of the big steel companies are mostly fully employed and will apparently continue so. Thus the make of pig iron keeps up remarkably well in view of the general state of the trade. The production in March rose to 1,073,116 metric tons, which is more than for any other month since December, 1907, and exceeded the February production by not less than 133,000 tons. The April production, just announced, was 1,047,000 tons.

Whether production will continue at the present rate looks more than doubtful. While some of the big steel companies are actually putting up new furnaces of larger capacity to take the place of more or less antiquated ones, it is said that a number of the independent furnaces will have to blow out within the next month or two unless conditions greatly improve. But there is absolutely no prospect of such a change. On the other hand, the pig iron market is described as being extremely quiet. There is almost no new demand, and the calls for delivery on current orders are far below what the furnaces have the right to expect. Whatever new business comes upon the market is bid for very sharply, and, there being now no longer any syndicates to keep up prices, the present competition leads to still further concessions in prices. One exception to this is found in recent sales of Luxemburg furnaces to Belgian mills, which were effected, according to reports, at an advance of several francs. But this is referred to as a local incident, without significance for the general situation. On the other hand, sales have been recently reported as made by Lorraine furnaces to Belgium at prices below list.

The following are some of the latest quotations for various kinds of iron: Spiegeleisen in the Siegen District, 63 to 65 marks; puddling, 56 to 58; German Bessemer, 58 to 61; foundry, No. 1, 58 to 60; No. 3, 57 to 59; German hematite, 59 to 61. For Luxemburg makes the prices are 49 to 50 marks for basic iron; 44 to 46 for puddling, and 47 to 49 for foundry. On the Duesseldorf Exchange English pig was quoted a week ago at 67 marks, for delivery at Ruhrort, which means a reduction of 1 mark since the previous quotation, but Luxemburg foundry was quoted at 46 to 48, which is an advance of 1 mark.

Rolled Products.

In most sections of more finished goods business remains very unsatisfactory. In class A (steel rails, structural shapes and billets) the shipments of the Steel Syndicate in March were unusually heavy. They amounted to 518,000 tons, which is the heaviest movement for some months. The large shipments were due to the fact that much business was hurried forward for delivery before the conclusion of the business year at the end of that month. In April, on the other hand, shipments dropped back to 376,000 tons, which is near about the same quantity as was shipped in April, 1908, and the smallest for some months.

In billets the mills continue to run at about 70 per cent. of their normal rate, and the trade situation has not improved for a month. Consumers are buying small supplementary amounts for the current quarter, but no contracts for the third quarter are as yet coming forward, the price lists not yet having been fixed. It is expected with certainty, however, that no reductions will be made. The prices quoted in this department of the market are as follows: For ingots 82.50 (basic Bessemer steel), blooms 87.50, billets 95, muck bars 97.50 marks. Siemens-Martin qualities range 5 marks higher. The mills making this kind of steel are still troubling the great works of the Syndicate, as they are offering their product at competitive terms, and many consumers prefer their product.

In beams and other structural shapes trade is dull, the spring building operations still failing to call forth new business in any mentionable quantities. Moreover, this class of goods is sold chiefly through dealers, and these have large stocks on hand which it will take some months to work off, even if business improves. While home orders are very scarce, business for export has grown somewhat better within a month. In steel rails the syndicate has been able to take some pretty good orders recently from home cities for grooved rails, while further contracts are under negotiation. Some good foreign orders are also in the market, but it is not known whether they have been placed.

The bar trade remains the least satisfactory section of the market. Here everything is in a state of confusion. The degree of employment differs greatly with different classes of mills. The bar mills connected with the great conglomerate steel mills are mostly pretty well occupied, partly for consumers and partly for dealers, but most of the mills outside the Syndicate are having a hard time in holding up against the Syndicate works. The tendency of prices continues downward. For ordinary bars of soft steel 95 marks may now be regarded as an average prices, but one correspondent asserts that he has seen contracts quite recently at 93 marks, while export prices range as low as 90 marks. In other words, the prices of bars are considerably lower than those of the materials out of which they have to be rolled. Even so, the great Syndicate mills are increasing their output of bars and thus making things still hotter for the independent bar mills.

Hardly less satisfactory is the position of the heavy plate mills. Here, too, prices have been pressed still lower within a month. Heavy plates of ordinary quality are now going at about 105 marks, but for export at about 95 marks. The negotiations for the organization of the heavy plate business have been kept up until this week. Yesterday, however, a final meeting was held, at which it was found that it was impossible to reach an agreement; and the negotiations were declared broken off altogether. Thus the same fate has overtaken the heavy plate mills as about a year ago the rollers of fine plates, and more recently the bar mills. In all these goods, it is now admitted, the situation of the various works is so different in respect to the costs of production, and the conditions surrounding the production of the various sizes and shapes of bars, that a syndicate arrangement is an impossibility. All this, again, is increasing the apprehensions regarding the future of the Steel Syndicate. Developments are regarded as decidedly against the probability of its renewal upon the expiration of the present contract.

In some branches of the hardware trade a slight improvement is noted, but the general situation remains pretty bad. Orders for staple goods have been coming in from the United States in increased amounts owing to the expectation that the new tariff bill will raise the duties to still higher level; and there is much fear among manufacturers that such an increase will be made. The cutlery trade, in particular, reports a moderate improvement in trade, and the better business in rivets and screws continues. Business is also pretty good in agricultural goods. In all other sections of the trade, however, including builders' hardware, business remains very poor.

Philadelphia.

PHILADELPHIA, PA., May 18, 1909.

The feature of the week has been the heavy buying of pig iron by the Eastern steel mills, about 60,000 tons of basic iron being taken for second and third quarter delivery. More activity has also been shown in low phosphorus iron, several round lots having been sold. In finished materials the most important transaction has been the placing of the Philadelphia & Reading viaduct work, embracing something over 16,000 tons, with the McClintic-Marshall Construction Company. Steel plate makers report a better volume of business, while sheets also show some improvement. Finished material mills, in the majority of cases, show an increased tonnage of business, but as the demand heretofore has been so very irregular some doubt is expressed as to the permanency of the present buying movement.

Pig Iron.—Basic iron has been bought in varying tonnages by practically every user in this territory, the aggregate being estimated at 60,000 tons. The greater proportion was sold for delivery during the balance of the second and the third quarter; in but one instance, it is understood, has the delivery extended beyond the latter period. The ruling price at which this grade was sold was $15, delivered, although for one lot $15.25 was obtained. Several sellers, who are pretty well sold up, now hold basic at somewhat higher figures, particularly for fourth quarter delivery, but prompt iron can no doubt still be had at the ruling price. There has also been a better movement in low phosphorus iron; sales of one lot of several thousand tons, as well as small lots of standard iron for early shipment, are reported at equal to $19.50, delivered in this territory, while 1000 tons of misfit iron was taken by a local buyer at the same basis. Quite a good volume of business has been done in foundry grades, notwithstanding the fact that many of the larger buyers have covered. Sales of three 2000-ton lots of pipe iron to different buyers, at equal to $15, delivered here, are reported, while several round lots are still unclosed, owing largely to the fact that the sellers have stiffened somewhat on this grade, and some ask an advance of 25c. a ton. Thousand-ton lots, embracing both No. 2X and No. 2 plain, have been taken by several local and nearby melters for delivery extending through the third quarter, at prices rang-

ing from $16 to $16.50 for No. 2X, the bulk of the business, however, being done at $16.25, delivered, although some sellers are very firm at the higher figure for strictly third quarter shipment. Virginia foundry grades have been more active and prices are firmly maintained. The tonnages taken in this territory have, as a rule, been small individually, although one lot of 700 tons of No. 2X for nearby delivery is reported at the ruling price. Southern foundry iron is rather quiet, particularly at current prices, which are higher than standard Northern brands delivered in this territory. Forge iron is rather dull; some small business has been done, but little in the way of round tonnages has developed. The market on the whole presents a somewhat firmer appearance; sales recently have been larger than generally realized, and some sellers find they have sold about all they care to at the prevailing low prices, and have marked up their asking prices 25c. to 50c. a ton, but others are still willing to accept business, particularly if deliveries begin at once, on the basis recently quoted, while some irons not entirely up to grade may still be had at a concession. For delivery in buyers' yards, Eastern Pennsylvania and nearby points, during the balance of the second and the third quarter, the following range of prices is quoted for standard grades, in instances an advance of 25c. to 50c. being asked for strictly fourth quarter shipment:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.50
Eastern Pennsylvania, No. 2 plain	15.50 to 16.00
Virginia, No. 2 X foundry	16.50 to 16.75
Virginia, No. 2 plain	16.25 to 16.50
Gray forge	14.75 to 15.00
Basic	15.00 to 15.25
Low phosphorus	19.50 to 20.00

Ferromanganese.—There has been a little more inquiry, mostly for small lots, for early delivery, although several fair sized lots for Western delivery are before the trade. For prompt delivery, $40 to $40.50, Baltimore, is named for 80 per cent. ferro, for delivery during the last half; however, $41 to $42, Baltimore, is named by some sellers.

Billets.—The tonnage placed has been light and is largely for prompt delivery. Consumers are willing to place orders for round lots for extended delivery, but sellers generally refuse to accept business of that character at the present price level, which for ordinary rolling steel for prompt shipment ranges from $24.50 to $25, delivered in this territory. Forging steel commands an advance of $2 a ton, the usual extras applying for high carbons and special sizes.

Plates.—The demand covers quite a wide range, orders for railroad, boat, bridge, structural and boiler plates coming out quite freely, and in instances running into fairly large tonnages. Eastern mills have as a rule gained somewhat in the volume of business taken and feel more encouraged with the outlook. Prices are a shade firmer, less disposition being shown to cut sharply for competitive business. For delivery in this territory 1.45c. is named for carload lots, small quantities commanding a tenth advance. The customary extras apply as usual.

Structural Material.—The most important contract placed in this territory during the week was for 16,100 tons for the Philadelphia & Reading viaduct work, which went to the McClintic-Marshall Construction Company, the lump price, it is understood, being close to $860,000. The same company is now asking for bids for the general construction work on a small section, covering three blocks, to complete the elevated work between the Terminal and Broad street, which will require about 1200 tons.

Sheets.—The demand has been better, and, while buyers would anticipate requirements, sellers refuse to accept tonnage for extended deliveries at ruling prices, which are decidedly firmer, mills making no concessions from ruling quotations, which for delivery in this territory range as follows: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—A somewhat better demand is noted, but sellers are not anxious for any very heavy tonnage at the present price level and frequently refuse to quote except for prompt lots. What business has been done has been at a slightly higher level of prices. Steel bars are firm, at 1.35c., delivered in this territory; refined iron bars are stiffer, at 1.40c. to 1.50c., while common bars may be had at prices ranging from 1.35c. to 1.40c., delivered in this vicinity.

Coke.—Little change is observed in the demand. Scattered sales of foundry coke are reported at unchanged prices. Spot foundry coke is still weak, but for extended delivery prices are firmer. Some little business has been done in furnace coke for delivery during the last half of the year at a fair price. For delivery in this territory prices are unchanged and range about as follows:

Connellsville furnace coke	$3.85 to $4.10
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.70
Foundry coke	3.70 to 4.10

Old Material.—Prices on nearly all grades show an advance, although sales have been comparatively light. While transactions in heavy melting steel have not been active, an urgent demand on the part of a few consumers has advanced prices. Holders of any quantity of scrap refuse, as a rule, to sell at the present level, while dealers in instances express a willingness to pay the inside quotation for tonnage. Rolling mill scrap has been in more urgent demand, although the bulk of the sales have been small individually. Prices, while to a certain extent nominal, range about as follows for delivery in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$15.25 to $15.75
Low phosphorus	18.50 to 19.00
Old steel axles	19.25 to 19.75
Old iron axles	21.50 to 22.00
Old iron rails	18.00 to 18.50
Old car wheels	15.00 to 15.50
Choice No. 1 R. R. wrought	17.25 to 17.75
Machinery cast	14.75 to 15.25
Railroad malleable	14.00 to 14.50
Wrought iron pipe	15.25 to 15.75
No. 1 forge fire scrap	12.50 to 13.00
No. 2 light iron	8.50 to 9.00
Wrought turnings	12.25 to 12.75
Stove plate	12.75 to 13.25
Cast borings	10.25 to 10.75
Grate bars	13.00 to 13.50

Buffalo.

BUFFALO, N. Y., May 18, 1909.

Pig Iron.—There is a continued improvement in demand for foundry, malleable and basic iron, both for present and future deliveries, the increased consumption evidently reflecting a very much better and stronger feeling and broader interest on the part of users, who are now freely placing large orders in contrast with recent conservative buying. Prices have remained about stationary, although manifesting a slight tendency toward hardening, especially for forward deliveries. Furnaces are not urging sales for last half and quotations for such deliveries are a little above early delivery prices. We quote as follows for second and third quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	$15.25 to $15.75
No. 2 X foundry	14.75 to 15.25
No. 2 plain	14.50 to 15.00
No. 3 foundry	14.25 to 14.75
Gray forge	14.25 to 14.50
Malleable Bessemer	14.50 to 15.50
Basic	15.50 to 15.75
Charcoal	19.50 to 20.00

Finished Iron and Steel.—The volume of business on bars, plates and shapes continues gratifyingly large, keeping the sales department of the mills and agencies exceedingly busy. Specifications on contracts for all finished products and structural shapes are also increasing. Prices, though not quotably changed from last week, are very firm, with an advancing tendency. In structural material the demand is heavy, with indications that large business will develop right along through the summer. Bids will be received this week for steel for the Swan Street Warehouse, to be erected by the C. J. Hamlin Realty Company, Buffalo, about 500 tons, and next week for about an equal quantity for the eight-story Y. M. C. A. Hotel. The Lackawanna Steel Company is to furnish the steel for the Sinclair-Rooney Building, Buffalo, about 800 tons, which will be fabricated by the Buffalo Structural Steel Company. Wurtz & Son, Buffalo, were low bidders for the 1250 tons of structural material required for the new water works pumping station, Buffalo. The Dominion Bridge Company was awarded contract for the 1000 tons of steel required for the new Bell Telephone Company's building, Toronto, and McGregor & McIntyre, Ltd., Toronto, the contract for steel for the manufacturing building and power plant to be built by the Canadian Kodak Company, in that city, 150 tons. The Eastman Kodak Company's factory building, Rochester, figured for both structural steel and reinforced concrete, will be built of reinforced concrete, the contract having been awarded to the Ferro Concrete Construction Company, Cincinnati.

Old Material.—There is an active inquiry from consumers, but purchasers are still unwilling in most instances to pay the prices asked by dealers, who are not disposed to sell except at an advance, the result being a deadlock which has prevented any considerable trade during the week. Dealers' prices, which are firm and stiffening, are approximately as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel scrap	$13.50 to $13.75
Low phosphorus steel scrap	17.00 to 18.00
No. 1 railroad wrought	14.50 to 15.25
No. 1 railroad and machinery cast scrap	14.50 to 15.50
Old steel axles	16.00 to 17.00
Old iron axles	19.00 to 19.75
Old car wheels	14.50 to 14.75
Railroad malleable	13.00 to 13.50
Boiler plate	12.00 to 12.50
Locomotive grate bars	11.50 to 12.00
Pipe	11.00 to 11.50
Wrought iron and soft steel turnings	7.75 to 8.25
Clean cast iron borings	6.75 to 7.25
No. 1 busheling scrap	12.00 to 13.00

San Francisco.

SAN FRANCISCO, May 12, 1909.

The dullness which prevailed in this market during April proved to be only temporary. An accelerated movement is now observed in nearly all lines, apparently due in part to the firmness which has recently developed on several products. The requirements of the territory covered by San Francisco are evidently larger than was apparent a few weeks ago, and local interests no longer show any hesitation about placing orders. There is a steady demand for agricultural implements of all descriptions, and the movement of machinery is gradually increasing, with numerous inquiries for lumbering equipment and machine tools. The situation in regard to merchant pipe is the most favorable since the first of the year, the jobbers reporting liberal inquiries from all parts of the territory. A large tonnage of bars has been booked within the last two weeks, and a decided improvement is noted in the demand for sheets and plates, the jobbing movement of which is of larger proportions than for many months past.

Structural Material.—Few new contracts for the erection of buildings have been placed since the first of the month, but the situation is regarded as encouraging, as inquiries have come up for a liberal tonnage, which is now being figured. In view of the increasing firmness of prices local fabricators show a tendency to place contracts ahead of immediate needs. The building situation locally is most encouraging, the record for April showing contracts to the amount of $3,330,909, about $380,000 more than the month previous, with an increasing proportion of permanent structures. A number of inquiries are being received from points outside of San Francisco. Locally a number of large projects, including the new wing for the St. Francis Hotel, are to come up shortly, and several contracts will be let within the next week or two. One order has just been placed for about 1200 tons, but the contract has not yet been confirmed. The Boalt Law Library of the University of California, requiring about 700 tons, is now being figured, and a contract will be let in a few days for 300 tons for the new Corporation Yard Building. Other jobs of some importance are the Prager Building and the First National Bank of San José, Cal. The Pacific Rolling Mill Company has taken a small tonnage for the local pipe testing plant. The American Bridge Company has taken a moderate tonnage for an eight-story hotel at Geary and Mason streets. Figures will shortly be taken on the steel terminal building of the Western Pacific Railroad in Oakland. F. E. Smith is preparing to erect a nine-story building at Portland, Ore. The Odd Fellows' lodge at Stockton, Cal., is preparing to erect a steel frame structure of eight stories. The new sections of sea wall, to be let June 19, will require 181 tons of structural shapes, in addition to considerable tonnage of reinforcing bars. The Harbor Commissioners are also planning to erect two steel buildings on the new bulkheads within the year.

Rails.—Light rails have been at a standstill for many months, but a number of moderate orders are now being placed. Standard rails are still exceptionally quiet, the movement being limited to a few hundred tons. New inquiries are coming up amounting to a fair tonnage, but the promoters of new railroad projects in this territory are still greatly handicapped by lack of capital. The requirements in immediate prospect are limited almost entirely to small extensions, and are covered as a rule by former contracts. A representative of the new Sacramento & Sierra Railroad has gone East to place orders for the rails, track supplies and rolling stock required for this summer's construction. The Southern Pacific is about to rebuild its branch from Marysville to Oroville, laying 70-lb. rails. Work is soon to be commenced on the road between Goldfield and Ely, Nev. The Spokane, Wallace & Interstate Railway of Spokane, Wash., will begin the construction of an 80-mile line in about a month, laying 70-lb. steel. Several miles of the Santa Rosa-Clear Lake Railroad are to be laid this summer. The United Railroads will probably specify a moderate tonnage within a few weeks. Conditions have been less favorable to the logging interests than was expected, but a number of orders are coming in for the extension of logging roads, and several logging locomotives have been purchased during the last two months.

Pig Iron.—Local foundry operations are still being conducted on rather a limited scale. The requirements of the city in the way of special fittings and castings of various kinds in connection with its large cast iron pipe system are expected to give a strong impetus to foundry work, but no business of this nature is likely to materialize until the first deliveries are made on the pipe contract. The demand for structural castings and ornamental work shows slight improvement, but there is little inquiry for machinery castings and few of the local foundries are operating at anything like full capacity. Somewhat more work is reported in other coast cities, to which a few small shipments of pig iron have been made of late, but the market remains in an extremely dull and unsatisfactory condition. Importers find considerable difficulty in placing any foreign iron to arrive, and their efforts to reduce their present holdings have a depressing effect on the market. There have been no arrivals of much consequence of late, but a large tonnage is expected during the summer. A small lot of English high silicon iron was sold recently at $22 per ton, ex-yard, and still lower prices would probably be made for round lots. No. 2 Alabama pig iron is offered at $21.50, and No. 1 Chinese at $22.50. Purchases are generally limited to a few tons for immediate use, as the foundries are unwilling to carry a greater surplus than necessary.

Cast Iron Pipe.—The contract for the installation of the first section of the Oakland fire protection system has been awarded to the Cotton Bros. Construction Company, which will place the order for pipe this week. The requirement will be 500 tons. Bids have been called on the second section, to be opened June 2. Redwood City is again in the market, calling for bids to be received May 17 for 1500 ft. of 6-in., 1000 ft. of 4-in. and a lot of specials. Bids have been received for a large lot of globe valves to be used in connection with the San Francisco system, but no award has been made. No tonnage of much consequence has been booked this month from the smaller towns, but numerous inquiries are coming from this quarter, and an increasing movement is anticipated during the summer. Many California towns are planning extensions of water systems, and with few exceptions are making provision for the use of cast iron pipe. Several systems built within the last 20 years of other materials will have to be replaced in the near future. The town of San Luis Obispo has determined to replace its large steel pipe system with cast iron, and has placed an initial order for 70 tons, to be followed shortly by larger contracts. Orders have also been taken for 2000 tons for San Diego and 1200 tons for Los Angeles. The gas distributing system of Covina, Cal., is to be extended to neighboring towns. The town of Monrovia, Cal., is working on a bond issue of $134,000 to provide for the extension of its water system. Both gas and water systems are shortly to be installed at Coalinga, Cal.

Merchant Pipe.—No inquiries of unusual importance individually have come up this month, but conditions are more encouraging than for some time, and the total tonnage booked is quite satisfactory. A steady jobbing demand, which has been lacking up to the present month, is now making itself felt. Numerous small orders are coming in from all parts of this territory, and the local merchants have been compelled to buy more liberally to fill immediate needs. They also show a greater disposition to order some stock ahead, and a liberal tonnage is now moving to jobbers in other coast cities, as well as in San Francisco. Moderate orders are coming from the oil interests, though this business is of smaller proportions than was anticipated.

Old Material.—Local dealers are taking little interest in steel melting scrap, though the market has a firmer tone in response to Eastern conditions. Old steel rails and structural scrap in round lots are bringing about $8.50. A large tonnage of this material is now moving to the Eastern market, and local holders hope to dispose of most of the large stock on hand. A shipment is now being made by a line of ships recently established by a local firm, which is offering low rates. The French bark Bretagne, which recently arrived with pig iron, will carry a lot of scrap from this port to Europe. Cast iron scrap is meeting with ready sale at firm prices, and dealers are now carrying only moderate stocks. Heavy material is still offered at $18 and lighter cast scrap brings $16 to $17. Wrought scrap is held at $10.50. The United Railroads now has on hand about 500 tons of wrought scrap, a large part of which was removed from its old cable conduits, but most of its other old material has been disposed of.

The large steel girders now being taken from the ruins of the San Francisco City Hall dome and cut up on the ground are claimed by the makers to be the largest box girders in the world. They are each 126 ft. 9 in. long, 5 ft. thick and 6 ft. 5 in. high and weigh 125 tons each. They were made up in place, as no machinery was available at the time which could handle the girders complete.

The Western Steel Works has been incorporated in San Francisco, with a capital stock of $10,000, by A. Haase, T. H. Downie and D. Reinhold.

The Samson Iron Works, Stockton, Cal., has decided to add a steel foundry to its plant. A brick and steel building, 80 x 125 ft., will be erected at once to accommodate the new department.

The foundry at the Oregon State penitentiary at Salem, Ore., was totally destroyed by fire May 4, causing a loss of $30,000, with no insurance. The foundry was under lease to Lowenberg, Going & Co., of Portland.

The city will shortly purchase a $4500 locomotive crane with which to handle the 45,000 tons of cast iron pipe ordered last month.

The Western Pacific Railroad has applied for permits for the first buildings of its shops in Oakland, including a corrugated iron roundhouse, boiler room and machine shop, corrugated iron mill and steel oil tank.

W. G. Dozier, Jr., formerly agent for the Santa Fé at

Stockton, Cal., has taken over the management of the Cyclone Iron Works of that city.

The city of Los Angeles has awarded a contract for wire fabric to the American Steel & Wire Company for $20,000, and for twisted steel bars to the Union Hardware & Metal Company for $43,000.

The Northern California Engineering Company has let a contract for a large building at Redding, Cal., to be used as a foundry and general iron works. The enterprise is headed by I. J. Johnson.

Pierce Johnson and D. N. Wheeler, representing a safe manufacturing house, are negotiating for a site for a factory at Everett, Wash.

Metal Market.

NEW YORK, May 19, 1909.

Copper.—The market is slightly easier, but prices are unchanged from those quoted last week. Sales of lake copper were made late last week at 13.50c., New York, and some business was done this week at 13.25c. Electrolytic has been offered at 13c., with no resultant business. Some competition for small lots has been noted. Considerable metal is being shipped to consumers by water, which was delayed awaiting the resumption of Lake navigation. This will have a marked effect upon the statistics to be issued later, and which will undoubtedly favor holders of the metal. Exports to Europe are large, amounting so far this month to 16,958 tons. The London market shows copper held at £59 3s 9d for spot, and £59 17s 6d for futures.

Pig Tin.—The market is weak, the metal being quoted at 28.80c. to 28.85c. on May 18. The following table indicates the trend of the market:

	Cents.
May 13	29.00
May 14	28.90 to 28.95
May 15	28.90 to 28.95
May 16	28.90 to 28.95
May 17	28.90
May 18	28.80 to 28.85

When it is considered that the shipments from the East are expected to exceed 5500 tons, the prospect for immediate higher prices appears dubious. The London market to-day closes at £131 5s. for spot and £132 5s. for futures. The arrivals so far this month are 2777 tons, and the afloats 2842 tons.

Lead.—This metal continues strong, outside sellers quoting 4.35c. to 4.40c., New York. The American Smelting & Refining Company continues to quote shipment lead at 4.30c., New York. It is said, though, that this company is not an anxious seller at that figure, its shipping schedule being four weeks late. Orders booked now will be shipped the latter part of June. In St. Louis lead is strong at 4.30c.

Spelter.—The market for this metal is slightly higher, the prices quoted being 5.15c., New York, and 5c., St. Louis. Considerable cutting of prices has been reported, however, and the market is not very active.

Antimony.—Business continues quiet, and no change in prices has been noted. Hallett's is quoted at 7.75c. Cookson's at 8.25c. to 8.50c., while other brands are stationary at 7.50c.

Tin Plate.—No changes in quotations are heard in tin plates, but the outlook appears good. For 100-lb. IC coke plates prices continue at $3.64, New York, and $3.45, Pittsburgh. This is subject to the usual rebate of 5c. per box for large orders. In Swansea Welsh plates remain at 11s. 9d.

The annual meeting of the stockholders of the Woodward Iron Company was held in Woodward, Ala., May 12. The following were elected directors of the company: J. H. Woodward, J. N. Vance, W. T. Burt, A. H. Woodward, Robert Jemison, R. H. Banister and H. E. Vance. At a subsequent meeting of the Board of Directors the following officers were elected: J. H. Woodward, president; A. H. Woodward, vice-president; R. H. Banister, secretary; Charles H. Abbott, treasurer.

The last of the blast furnaces of the Edgar Thomson Works at Bessemer, Pa., has blown in. The two Bellaire furnaces have started and the Bellaire steel plant will soon resume. Then all of the works of the Carnegie Steel Company will be in operation with the exception of the Columbus and North Sharon works.

The Samuel C. Tatum Company, Cincinnati, will celebrate its fiftieth anniversary on the afternoon of June 10, and will throw open for inspection its large new plant at Collerain avenue and Monmouth street.

New York.

NEW YORK, May 19, 1909.

Pig Iron.—Interest has centered in the heavy sales of basic pig iron by three furnace interests, the total since the beginning of the movement figuring up to 75,000 to 80,000 tons, which was sold at $15, delivered. Sellers are now asking an advance of 50c. Some of the large foundry interests in this district are still rounding out their purchases, but the bulk of the business with them has now been done for the present. Sellers are asking higher prices, and are demanding an advance of 25c. per ton for the third quarter and 50c. for the fourth quarter, on foundry iron. We quote $16.75 to $17 for No. 1 Northern foundry, $16 to $16.50 for No. 2 foundry and $15.50 to $15.75 for No. 2 plain. Alabama iron is quoted $16.25 to $16.50 for No. 1 foundry, and $15.75 to $16 for No. 2 foundry.

Steel Rails.—The only business closed during the week in the Eastern territory is 9000 tons for the Bangor & Aroostook road, by the Pennsylvania Steel Company.

Structural Material.—A number of small orders have been placed locally, but none of the large work pending has been awarded. The estimating departments of the leading plants are crowded with work, and there is a distinct tendency to demand better prices for fabricated work. Among the inquiries at hand is one lot of 3000 tons for the Hewitt interests.

Ferroalloys.—Buyers are anxious to make contracts for future delivery of 50 per cent. ferrosilicon, but sellers are unwilling to risk too much in the way of hard and fast bargains. All business now being done contains a duty clause protecting the seller. Sales have been made at $63 to $65, Pittsburgh. Quite some business has developed in ferromanganese at prices approximating $42, Baltimore.

Bars.—Business is somewhat more active in bar iron, with quotations on best refined ranging from 1.40c. to 1.45c., tidewater. Steel bars are moving quite freely, with some fair contracts now being closed. The demand for twisted bars for concrete reinforcement has not been active recently, but a sale of 500 tons was made the past week. The price of steel bars is firm, at a minimum of 1.36c., tidewater.

Plates.—The demand is still quite light, seldom running above carload orders. Tank plates and ship plates are held at 1.46c., tidewater.

Cast Iron Pipe.—The city of Harrisburg, Pa., has placed an order for its year's supply, but the quantity has not been determined, probably falling short of 1000 tons. Quincy, Mass., has bought 400 tons. The city of New York will open bids to-day for about 1250 tons. The foundries in the East are getting quite well filled, some of them having more orders for particular sizes than they are able to supply and being obliged to purchase from other foundries to cover their requirements. It is evident that much more buying has been done than the transactions coming to light would seem to indicate. The market is decidedly firm at a minimum of $23.50 per net ton for 6-in. at tidewater.

Old Material.—The excitement noted last week has subsided, as the dealers short of certain classes of scrap secured what they needed and consumers have not shown much eagerness to buy at the prices thus fixed. No large inquiries are now before the trade in this immediate territory, but some fair business has been transacted in some lines of rolling mill stock, as well as in heavy cast scrap and stove plate, while it is observed that numerous mills are willing to purchase if dealers will meet their views as to prices. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	$12.00 to $12.50
Heavy melting steel scrap	12.00 to 12.50
Relaying rails	20.00 to 20.50
Old iron rails	14.50 to 15.00
Standard hammered iron car axles	16.00 to 16.50
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
Iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	12.50 to 13.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron	6.50 to 7.00
Cast borings	7.00 to 7.50
Wrought turnings	8.50 to 9.00
Wrought pipe	10.50 to 11.00
Old car wheels	13.75 to 14.25
No. 1 heavy cast, broken up	13.00 to 13.50
Stove plate	10.50 to 11.00
Locomotive grate bars	10.00 to 10.50
Malleable cast	13.00 to 13.50

Announcement is made that application for a charter for the Baldwin Locomotive Works, Philadelphia, will be asked of the Governor of Pennsylvania June 3. This great business, now owned by Burnham, Williams & Co., has always been conducted as an unlimited partnership. It appears that the time has now arrived when the owners believe that the corporate form would be preferable. The business was founded in 1832.

Iron and Industrial Stocks.

NEW YORK, May 19, 1909.

Security values have been well maintained, but usually slightly under those prevailing in the preceding week. The range of prices on active iron and industrial stocks from Thursday of last week to Monday of this week was as follows:

Allis-Chalm., com...	15⅞- 16½	Railway Spr., pref..	105 -106
Allis-Chalm., pref..	50¼- 52⅝	Republic, com.....	26 - 27⅛
Beth. Steel, com..	26½- 27¼	Republic, pref.....	85¾- 87
Beth. Steel, pref..	55 - 55½	Sloss, com.....	80 - 81
Can. com.....	12¾- 13⅞	Pipe, com.....	33¾- 34⅞
Can, pref.....	81½- 83	Pipe, pref.....	78 - 78¾
Car & Fdry, com..	54½- 55¼	U. S. Steel, com...	55⅞- 57¾
Car & Fdry, pref..	116 -116⅞	U. S. Steel, pref...	118½-119¼
Steel Foundries....	39 - 39½	Westinghouse Elec.	83⅛- 85½
Colorado Fuel.....	39⅜- 41¾	Chi. Pneu. Tool...	22 - 23
General Electric...	159 -161¾	Am. Ship, com....	60 - 60½
Gr. N. ore cert....	71½- 73	Am. Ship, pref....	106 -106¼
Int. Harv., com.....	80¼	Cambria Steel.....	37¾- 38½
Int. Harv., pref...	120⅛-120½	Lake Sup. Corp...	30 - 32⅜
Locomotive, com...	57 - 58½	Penna. Steel, pref.	105 -105¼
Locomotive, pref..	115 -115⅞	Warwick	8
Nat. En. & St.,com.	14½- 16½	Crucible St., com..	8¼- 9½
Nat. En. & St.,pref.	86 - 87	Crucible St., pref..	66 - 68
Pressed St., com..	41¼- 42¼	Harb.-Walk. Ref., com...	17
Pressed St., pref...	103 -104	Harb.-Walk. Ref., pref...	82
Railway Spr., com.	43 - 44		

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 59⅝, preferred 119½, bonds 104½; Car & Foundry common 55¼, preferred 116⅛; Locomotive common 57¼, preferred 115; Colorado Fuel 41¾; Pressed Steel common 41⅞, preferred 104; Railway Spring common 43⅜; Republic common 27¾, preferred 88½; Sloss-Sheffield common 80¼, ex-div.; Cast Iron Pipe common 34, preferred 78¾; Can common, 13¼, preferred 82.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, furnish the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926....	..	90
Bethlehem Steel purchase money 6s, August, 1998..	115½	118
Buffalo Iron 5s, October, 1925.....	100	..
Buffalo & Susquehanna Iron 1st 5s, June, 1932....	99¼	..
Buffalo & Susquehanna Iron deb. 5s, January, 1926. ..		98
Dominion Iron & Steel 5s, July, 1929.....	90	..
La Belle Iron 1st 6s, December, 1923.....	103½	106
Lackawanna Steel 1st 5s, April, 1923.....	98½	..
Maryland Steel 1st 5s, February, 1922.....	101	..
Penn Steel 1st 5s, November, 1917.....	101	..
Pennsylvania & Maryland Steel 6s, September, 1925.	109	110½
Republic Iron & Steel 1st 5s, October, 1934.....	..	100
Sloss Iron & Steel 1st 6s, February, 1920.....	105½	108
Sloss Iron & Steel consol. 4½s, April, 1918.....	94½	96½
**Jones & Laughlin 1st 5s, May, 1939.....	99½	99⅞
United States Steel Corporation.		
Collateral Trust 5s, Series A, C, E, April, 1951....	114½	115½
Collateral Trust 5s, Series B, D, F, April, 1951....	114½	115½
Sinking Fund 5s, April, 1963.....	104¼	104½
Union Steel 1st 5s, December, 1952.....	104⅝	105
Clairton Steel 5s, 1908-1913.....	100	..
St. Clair Furnace 1st 5s, 1910-1939.....	100	..
St. Clair Steel 1st 5s, 1908-1926.....	100	..
Illinois Steel deb. 5s, January, 1910.....	100¼	..
Illinois Steel 5s, April, 1913.....	100⅝	..

All bonds quoted "and interest."

The New York Air Brake Company has filed with the Secretary of State at Trenton, N. J., an amendment to its certificate of incorporation increasing its capital stock from $10,000,000 to $13,000,000. The company operates a large plant at Watertown, N. Y., and a branch factory near Moscow, Russia.

A Great Coal Combination.—The Consolidation Coal Company, Baltimore, Md., which has always occupied a prominent position in the soft coal trade, is now a very much larger factor. It has absorbed the Fairmont Coal Company, the Somerset Coal Company, the Clarksburg Fuel Company and the Pittsburgh & Fairmont Fuel Company, including all their subsidiaries, railroads, floating equipment, docks and other property. The several companies have a combined capital stock of $37,650,000 and own directly 200,000 acres of coal lands in Maryland, West Virginia, Kentucky and Pennsylvania. This is exclusive of bonded indebtedness. The new company will have a variety of different kinds of coal, which will make it one of the few companies, if not the only one, that can supply any character, quality or quantity, or all kinds, of bituminous coal that the markets are likely to demand. The absorption of these properties, it is claimed, will make the Consolidation Coal Company the largest mining industry of its kind in the world.

The business of the Arthur D. Little Laboratory of Engineering Chemistry, 93 Broad street, Boston, which was established in 1886, has been incorporated under the name Arthur D. Little, Inc.

Millions of Needless Loss.

As a result of the almost bloodless conflict with Spain, the actual hostilities of which lasted less than six weeks, the United States paid in 1908 $3,471,157 in pensions, with assurance of an annual increase for many years to come, and the rolls of the Pension Office to-day bear the names of 24,000 pensioners, over 19,000 of whom are invalids and survivors of this war. More than 18,000 additional claims are now pending, although the total of the Cuban army of invasion was only 20,000 men. In 1907 the United States paid in pensions a total of $146,000,000. For 1908 the appropriation was increased to $151,000,000.

In all the wars in which the United States has engaged disease has been responsible for more than 70 per cent. of the mortality, more than one-half of which could have easily been prevented through organization and preparedness. Preventable disease, more than wounds, swells the pension lists. Through the Museum of Safety and Sanitation, New York City, it will be shown how to lessen this loss. Statistics of the Pension Office prove that if this unnecessary loss had been avoided the saving in pensions alone would have paid the cost of the resulting war every 25 years. Aside from the sorrow of the homes made desolate, consider the economic value of the 70 per cent. of lives now uselessly sacrificed that might be saved as bread winners in industrial pursuits.

Industrial Education.—The committee recently appointed by the Indiana branch of the National Society for the Promotion of Industrial Education has elected the following officers: President, H. C. Atkins, president of E. C. Atkins & Co., Inc., Indianapolis; vice-president, Robert J. Aley, Indianapolis, State Superintendent of Education; second vice-president, A. O. Neal, Franklin, Ind.; third vice-president, C. N. Kendall, Indianapolis; secretary-treasurer, John A. Lapp, Indianapolis; directors, balance of present year, W. E. Stone of Lafayette, Robert Hall of Indianapolis, Dr. S. C. Dickey of Indianapolis; two years, Dr. E. A. Rumley of Laporte, F. W. Cooley of Evansville, Major Rosencrantz of Evansville; three years, W. W. Black of Bloomington, J. L. Ketcham, Charles Moores of Indianapolis. As an early means of promoting interest, the officers will co-operate in the arrangements for the commencement exercises of the Winona Technical Institute, Indianapolis, May 29, at which Prof. Paul E. Hanus, president of the Massachusetts Commission on Industrial Education, will deliver the address.

On the eve of his departure for Europe, May 13, President William E. Corey of the United States Steel Corporation expressed optimistic views. He said: "Since early in March there has been a gradual and well sustained improvement in the steel industry. Since the first of this month this improvement has been more pronounced. The subsidiary companies of the United States Steel Corporation are now operating on a basis of 70 per cent. of normal capacity, the highest since October, 1907. There is every indication that the improvement is due to a natural and healthy demand for our product, and with average crops and the early settlement of the tariff question we confidently expect a speedy return to normal conditions. The upward tendency of prices will be a gradual one, but the tendency is ever upward."

The Pittsburgh Furnace Construction Company has been organized by F. Felkel, Frank Felkel, Jr., William S. McKenna and Joseph McKenna, with offices at 413 Fourth avenue, Pittsburgh. The company designs and erects furnaces for all metallurgical purposes. It has recently completed a 25-ton open hearth furnace for the Erie Forge Company, Erie Pa.

Moorhead, Brother & Co., Inc., Pittsburgh, last Monday started up their puddling department and 100-in. plate mill at Sharpsburg, running to about half capacity.

The Machinery Trade.

NEW YORK, May 19, 1909.

Business with machinery houses is gradually increasing, and there are indications that it is slowly but surely returning to a normal basis. The pronounced upward tendency is manifested to some extent by the renewed activity of several of the large projects which have been held in abeyance for at least a year, and which contemplate the purchase of a great deal of mechanical equipment. The officials of two important industrial enterprises which prepared extensive lists of tools months ago are now revising their requirements with the intention of coming into the market at an early date. The new projects that have lately come forward, including that of the Fiat Automobile Company, whose new plant will possibly be erected at Poughkeepsie, N. Y., have had a favorable influence on trade. The betterment that has thus far taken place is shown by reports from representative houses, many of which state that if the last two weeks of May are as good as the first two the month will surpass any since the first of the year, and in some instances by a considerable amount. The transactions of the past week were almost wholly with the industrial interests, the railroads being but a small factor in the market. Inquiries from the former were numerous, but none carrying extensive lists were reported.

There is much activity in the mining machinery field at present, and there are some good sized inquiries in the market. Men who are familiar with that business state that this is largely due to recent activities in the development of copper mining properties. The American Smelting & Refining Company has been placing an encouraging amount of business, principally for additions to its various smelting plants, and there are inquiries in the market at present from the Miami Copper Company, 42 Broadway, New York, for machinery for a 200-ton concentrator to be erected at Globe, Ariz. The Indian Mining Company, Helena, Mont., is making arrangements for the construction of a large mill to be operated in connection with its gold mining property, near Pony, Madison County, Mont., and the Montana Copper Company, of which B. F. Tyler, New York, represents the controlling interest, has been organized to develop considerable mining property and will buy a large amount of machinery. This company, it is understood, will establish offices at Helena.

Reports indicate that many of the large railroads are buying considerable equipment, but thus far they have not come into the market to any extent for machinery. The purchases of rolling stock and track supplies, it is hoped, will be followed by the buying of shop equipment. The New York, Ontario & Western Railroad recently purchased several lathes for its shops at Norwich, N. Y., and the New York, New Haven & Hartford Railroad now has a list out covering about a dozen tools.

The Transcontinental Railroad has let contract for the erection of the following additional shops near Toronto, Ont.: Freight car shop, 200 x 600 ft.; paint shop, 100 x 325 ft.; coach shop, 125 x 250 ft.; planing mill, 100 x 300 ft.; lumber shop, 60 x 115 ft., and dry kiln shop, 40 x 50 ft. The steel structural work for the shops has been let to the Manitoba Bridge & Iron Works Company.

The Erie Railroad is having plans prepared and will shortly call for bids for an addition to its locomotive shops at Hornell, N. Y.; also for an additional car repair shop. The aggregate of the contemplated improvements at Hornell is mentioned at $250,000.

Indications are that the International Steam Pump Company will shortly come into the market for a large amount of machinery for its various plants. The company is now taking up the matter of equipment, and it is thought that the list which was prepared last July is being revised with the intention of making purchases at an early date. The list as prepared at that time covered about $50,000 worth of machinery.

Considerable buying is being done by the General Electric Company for its various shops, but no list of the requirements has been issued. Though the company has been buying a few tools at a time, it is said that the aggregate of purchases of the last month or two will reach a considerable amount. The company will soon start construction on an addition to its foundry at Schenectady, N. Y., which is already the largest foundry building in the world. The new addition is to be 200 x 485 ft., with structural iron frame and brick curtain walls. The building will be constructed by the contract department maintained by the company. Work has been started on the construction of the large addition to machine shop building No. 29.

A large amount of cement machinery will soon be purchased by the American Cement Engineering Company, New York, which is to construct a 4000-bbl. Portland cement plant for the Jamestown Portland Cement Corporation on the James River, about 10 miles above Newport News, Va. The Jamestown Portland Cement Company, Richmond, Va., incorporated with a capital stock of $2,400,000, has acquired property for the plant, the buildings of which will be of structural steel, requiring from 1000 to 1500 tons of steel. There will be installed a power plant of about 4000-hp. capacity, electrical equipment, steam shovels, elevating and conveying machinery, kiln driers, grinding machinery, &c., and it is expected that the engineering company will let contracts for the equipment before September 1. Lee B. Durstine, president of the North American Life Insurance Company, Newark, N. J., is president; James Nichols, president of the National Fire Insurance Company, Hartford, Conn., vice-president, and George M. Conner, New York, secretary and treasurer.

The equipment for the $150,000 structural steel and bridge plant to be erected at Memphis, Tenn., by the Virginia Bridge & Iron Company, Roanoke, Va., is now being purchased. Orders for three 40-ton cranes with 75-ft. span have been placed with the Northern Engineering Works, Detroit, Mich., and the metal sawing machinery has been purchased from Joseph T. Ryerson & Son, Chicago. The pneumatic equipment will be furnished by the Ingersoll-Rand Company, New York, and the electrical equipment by the Crocker-Wheeler Company, Ampere, N. J. Bids on the balance of the required equipment are at hand, and orders will be placed within the next few days.

The Maxwell-Briscoe Motor Company, Tarrytown, N. Y., continues buying against its machine tool list mentioned in these columns several weeks ago, and there remains considerable machine tool equipment to be bought, according to inquiries now in the trade. As has been stated, most of this machinery will be located in the plant the company recently acquired from the Ingersoll-Rand Company, which is being operated in connection with the Maxwell-Briscoe Company's Tarrytown plant.

The Carnegie Steel Company has been placing some orders of late in this vicinity for power equipment for its Duquesne plant. The Crocker-Wheeler Company, Ampere, N. J., has been given a contract for about 225 hp. of motors. This material, it is stated, is not required for any notable addition to the plant beyond increasing its power facilities.

The Board of Water Supply, New York, will receive bids until June 3 for contract 20 for work in connection with the Catskill aqueduct, including the construction of the Moodna siphon, a deep pressure tunnel in rock, 14 ft. diameter and about 25,000 ft. long, with seven shafts from 340 to 540 ft. deep, and about 4000 ft. of plain concrete conduit. The work is located in New Windsor and Cornwall, Orange county.

The Water Commissioners of Petersborough, Ont., will receive bids until June 14 for one and two 3,000,000 gal. pumping units consisting of pumps, water wheels, &c.

The North Carolina Electrical Power Company, Asheville, N. C., has completed plans for its proposed hydro-electric development on the French Broad River, near Marshall, N. C., where it is expected 5000 hp. will be produced. A concrete and stone dam, 36 ft. high, will be erected and a generating plant installed. The entire cost of operation is estimated at $450,000. The work of construction is delayed pending negotiations with the Southern Railroad for the relocation of its tracks in the vicinity of the proposed development, and as soon as this matter is settled work will be started.

Business Changes.

The Chain-Belt Company, Milwaukee, Wis., has concluded arrangements with the Fairbanks Company, New York, whereby the latter will act as its sales representative in the Eastern territory.

The Darley Engineering Company, manufacturer of suction conveyors, has abolished its Pittsburgh office, and its engineering, purchasing and sales departments have been transferred to New York, with offices at 159 Broadway. New officers have been elected, as follows: W. A. Stadelman, president and general manager; C. L. Inslee, vice-president; W. G. Hudson, vice-president; W. W. Ricker, treasurer, and M. D. Chapman, secretary.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 18, 1909.

A slight improvement in volume of orders is to be noted in the machine tool lines, with a marked improvement in inquiries. Working forces are being increased at nearly all establishments, so that a fair average at this time would be about 50 to 60 per cent. of normal and 40 hours would represent the average of working time per week. A few tool manufacturing establishments, however, are working practically full forces and 50 to 55 hours' time.

The automobile industry continues to furnish work for the manufacturers of milling machines, drills, lathes and shapers, and this business continues to grow.

A particularly noticeable feature in machine tool circles

in this territory is the tendency toward improvement of plants. Scarcely an establishment of any size or importance in the long list of concerns making tool specialties is to be found without some plans for enlargement of shop or office, and in many instances work is already in progress.

The Lodge & Shipley Machine Tool Company has finished its new office quarters and the officials are already established therein. The latest plan of the company is the inauguration of special dining quarters. A large brick mansion, known as the Bates Homestead, located near the plant, has been purchased and it will be moved nearer. It will be remodeled to afford commodious and comfortable dining room, kitchen, buffet and quarters for cooks and servants, and here the officers, superintendents, foremen of departments, draughtsmen and other office people of importance will have their daily luncheons. It will be a good sized family—about 55 in all.

The Smith & Mills Company, manufacturer of shapers exclusively, has painted and improved the exterior of its plant and built an entirely new office suite in another part of the building. This company, which has always enjoyed an excellent foreign business, notes an improvement in orders from abroad, some coming from France and England.

The John B. Morris Foundry Company has increased the working hours and number of employees the past fortnight. This company, which has a special department for the manufacture of tools and machinery, is now working 55 hr. and is employing about double the force of the early year.

With the dealers in this territory business has shown a steady improvement since the first of the year, and the more important report conditions practically normal. The business is in general lines of machinery, tools coming in for a good share of attention within the past few weeks. Little attention is given second-hand tools here, and they are rather a drag at dealers', although there has been considerable exchanging among shops.

The foundries are as yet showing but little improvement in melt, save those making miscellaneous castings, and they are quite busy. Three heats per week of from 8 to 10 and 12 tons are about representative of the situation.

The Massillon Malleable Iron & Steel Cross Tie Company, a new corporation for Massillon, Ohio, is headed by Bernhart Siber, and the capital to begin is $10,000.

Reports from Gurnsey, Ohio, indicate that the entire seven sheet mills comprising the plant of the American Sheet & Tin Plate Company, are now in operation.

The Victor Mfg. Company, Leavenworth, Kan., has opened offices at 286 North Third street, Columbus, Ohio. It will make this office central distributing headquarters for its product, wringers and washers. T. V. Allen, president, has taken up his residence in Columbus, and will be in personal charge of the office.

Chicago Machinery Market.

CHICAGO, ILL., May 18, 1909.

No other feature of recent market developments affords greater encouragement or is watched with livelier interest by the machinery trade than the increased activity observed in the iron and steel rolling mills. It is, of course, hardly to be expected that a notable degree of improvement will follow hard upon gradual betterment in this direction, but extended consumption of such material means the fuller employment of manufacturing capacities in the iron and steel working plants. For the past two years trade movements have been marked by a succession of ups and downs in which the fluctuations have been restricted within modest limits. Promising starts have at times awakened strong hopes of steady rise to permanently higher levels, only to be shortly dissipated by reaction in which a large part of the temporary gain was lost. In view of such experience the trade is disposed to accept such evidence of general improvement as now appears with some reservation as to the certainty of continued ascendency. The preponderance of opinion, however, inclines to the belief that the point has been reached where steady expansion of industrial activity may be expected, but that it will continue to develop slowly and conservatively seems assured. The orders received by the machine tool houses last week were about on an average with those of recent weeks, both in volume and character, but some promising inquiries under consideration are disappointingly slow in coming to a head. It is said that several prominent manufacturing interests have made up fair sized lists of tool requirements which will appear in the market as soon as the returning tide of prosperity sets in with force enough to make it sure that an early ebb will not follow.

One of the most suggestive intimations of what may be expected from the railroads in the way of more liberal expenditures for machinery and equipment is furnished by the enlargement of the plant of the Pullman Company, Pullman, Ill., which, it is announced, is about to be undertaken. It is fair to presume that this company, which by reason of its close connections with the railroads is doubtless well advised as to the probability of development of business in this direction, would hardly be taking active steps toward the extensive increase of its capacity if it were not convinced that the period of extreme retrenchment in railroad purchases was about to give way to a more liberal policy. While the machinery market is not at present receiving much actual support from this source, evidence pointing to better times ahead is accumulating.

The announcement that the Pullman Company is about to begin the construction of new steel car shops, plans for which have lain dormant nearly two years, is received with a marked degree of interest by the machinery trade. It will be recalled that prior to the panic in 1907 arrangements had been practically completed to go ahead with this work, but in view of subsequent developments it was for the time halted. The plant embraces a large increase in the present capacity for the construction of both passenger and steel freight cars, and includes the erection of several buildings of considerable size, all of which it is understood are to be of steel construction. When this project was up two years ago bids were taken on a large list of machinery required for the equipment of the proposed shops; none of it, however, was purchased at that time. As a result of the decision to go ahead with the work a reappearance of this list in the market is looked for soon, and will be eagerly awaited by the trade.

The Southern Pacific Company, San Francisco, Cal., has under construction at the Oakland shipyards a new blacksmith and boiler shop, in which the following equipment will be installed: One 3600-lb. steam hammer, forging machine, air bending machine for wheel stirrups, 50-in. upright drill press, oil furnace for heating large forgings, a smaller oil furnace for lighter work, two stationary cranes for steam hammer and blacksmith fire, electrically driven pressure blower, a set of 10-ft. bending rolls, also punches and shears, with stationary swing cranes attached, and a pair of bending clamps to be operated by compressed air. A 30-ft. traveling crane, with 28-ft. lift, will span the entire building.

George C. Christopher & Son, Wichita, Kan., have purchased a site for the erection of a modern structural plant which is to be equipped with machinery suitable for the handling of structural steel and boiler shop work and the manufacture of Eclipse concrete stone machines and concrete mixers. A stock of structural steel has already been purchased and is now in transit. Work upon the new plant will be begun at an early date.

At a recent meeting of the directors of the East Tintic Gold King Mining Company, Salt Lake City, Utah, it was decided to install new machinery at the mines, consisting of hoisting apparatus and drills, gasoline motive power preferred, for which the company is now in the market.

The Petersburg Electric Light Plant, Petersburg, Ill., will change its present system from single phase 125 cycle to three-phase 60 cycle, which will require the installation of a 150 or 200 hp. engine and a 150 or 200 kw. alternator; also additional engine units of 150 and 100 hp., together with condensers and other apparatus.

The University of Illinois, Champaign, Ill., is arranging to enlarge its power plant by the erection of an addition, 85 x 86 ft., to be constructed of brick and stone. The heating capacity of the plant will also be largely increased by the installation of additional apparatus. It is planned to complete this work during the summer vacation period. While no new machinery is to be installed in the building at present, it is expected that some purchases of equipment will be made in the near future.

The Red Cedar Valley Electric Company, Rice Lake, Wis., is negotiating for the drilling of deep wells for water supply and for the purchase of modern power driven pumps.

The Rifle Light, Heat & Power Company, Rifle, Colo., is having plans and specifications prepared for the construction of a hydro-electric plant to cost about $45,000. Bids for this installation will be called for about June 1.

Bids will be received until May 21 by the city of Madison, S. D., for two producer gas engines, one 80 hp. and the other 225 hp.; two belt driven revolving field alternators, one to be 150 kw. and the other 50 kw. Wm. Rae is city auditor.

The Interstate Light & Power Company, Galena, Ill., recently incorporated with a capital stock of $750,000, will erect a 2500-kw. steam power plant to furnish electric light to Galena, Ill.; Platteville, Wis., and adjoining towns, and for the zinc mines in that vicinity. There are about 50 active mines in the territory covered and a number have already signed contracts with the company for power. H. M. Byllesby & Co., Chicago, Ill., consulting engineers for the company, are now receiving bids on the machinery and expect to let contracts within a few days. It is expected that the plant will be ready for operation in the fall.

The Warner & Swasey Company, Cleveland, Ohio, has purchased the unoccupied half of the Brown & Sharpe lot on Washington boulevard, Chicago, and will at once erect a building for its Chicago office, with large showrooms for the display of its complete line of high grade machine tools. The lot has a frontage of 75 ft., the same as that of the Brown & Sharpe store, which it adjoins, and the Warner &

Swasey building will be of the same hight and general dimensions as that of Brown & Sharpe. The new building will be ready for occupancy in the fall. Many believe that this locality, which is within so short a distance of the new railroad stations, will in the near future become the machine tool center of Chicago.

A contract has been let by the Great Western Stove Company, Leavenworth, Kan., for the erection of a five-story brick and steel building, 45 x 200 ft., with a two-story addition, 22 x 150 ft. These additions to the old plant, with which they will connect, are for the purpose of concentrating the finishing work of castings after they leave the foundry. The buildings previously occupied for manufacture will be used for storage purposes. Aside from two new electric elevators to be installed, comparatively little additional machinery will be required.

New England Machinery Market.

BOSTON, MASS., May 18, 1909.

A slow but steady improvement in business is the characteristic of the machinery trade in all of its branches. The week has seen the placing of some very good business, and the nature of inquiries indicates that buyers do not propose to wait much longer before placing important orders. Prompt deliveries are specified in practically every instance, and manufacturers who have accumulated stocks are already beginning to be at an advantage. Skilled labor is becoming more scarce, labor bureaus reporting a continued demand for this class of workman, and complaints are heard that good men are not easy to find. It is probable that employers who have been compelled to reduce their forces to minimum proportion will have difficulty in getting back the same efficient organization which was established in 1906 and 1907. Nearly all of the machinery builders are busier, and some of them are actually passing the records of production made in 1907, because their facilities are better. Those of them who first felt the revival of business have been at a great advantage in getting the pick of labor.

Builders of crushing and grinding machinery are feeling a decided improvement in conditions. There is no special indication of increase in activity in the mines, but the cement and kindred lines are prosperous and are placing orders for machinery.

The wire business of New England is showing marked signs of improvement. The American Steel & Wire Company's works at Worcester are busier all through the departments, and the plant at New Haven, formerly operated by the National Wire Corporation, is taking on more men, some 350 hands being now employed. The independent companies of Worcester make similar reports. The recent advance in prices is looked upon in the trade here as a hopeful sign.

The Rogers & Hubbard Company, Middletown, Conn., states that it is interested in a gas producer outfit of from 100 to 125 hp. capacity. The company manufactures bone and ivory buttons, &c., and proposes to establish a fertilizer plant at Portland, Conn., where several acres of land have been acquired for the purpose. The producer will be located at these works, it is understood.

The Whiting Mfg. Company, New York, manufacturer of silver ware, is planning to remove its business to Bridgeport, Conn. The local Board of Trade has interested itself in the project, and members have acquired a 5-acre tract of land on Bishop avenue, near the line of the New York, New Haven & Hartford Railroad, where it is proposed to locate the new factory, which, with its equipment, will cost some $100,000. The Whiting Company has outgrown its present factory.

The American Steel & Wire Company is modernizing the machine shops at its works at Worcester, Mass. The older tools are being removed and replaced by modern machinery. Some orders have been placed recently, and it is planned to buy more equipment from time to time in the near future, with special reference to the use of the high speed steels.

The F. B. Shuster Company, New Haven, Conn., is putting on the market a new spiral coiling machine for coiling wire of from ⅛-in. to ⅜-in. diameter in coils of 4-in. to 30-in. diameter, in lengths up to 16 ft.

The Standard Brass & Copper Tube Company will establish a plant in New London, Conn., to manufacture high grade brass and copper tubing, 2½ in. in diameter and smaller, of any gauge in thickness. The works will begin operation in August. The company has a capital stock of $50,000. The incorporators are William M. Parke and Roger J. Heisler, New York, and Frederick J. Loomis, 46 Alger place, New London. Specialties will include brass and copper pipes of iron sizes and brass plumbing tubes.

The Universal Boring Machine Company, Hudson, Mass., is making preparations to enlarge its shop by an addition at the rear which will be built in the near future. The plans will also include an addition to the front of the structure to be erected later. The company is experiencing difficulty in keeping pace with its orders. All machines which have been built in the brief life of the business have been sold, as well as those now in process of manufacture.

The Bresnahan Shoe Machinery Company, Lynn, Mass., manufacturer of shoe machinery, is making tentative inquiries on a small lot of machinery which will be in addition to purchases recently concluded.

The Heald Machine Company, Worcester, Mass., manufacturer of grinding machines, is running at full capacity on orders. The company has recently added some machinery and contemplates the purchase of other tools, including a planer and drills. The capacity of the shops has already been considerably increased and will be still greater in the near future.

The Whittier Machine Company is selling the equipment of its shops at Granite and West First streets, South Boston, including a long list of machine tools, together with some woodworking machinery. The company is one of the constituent parts of the Otis Elevator Company and no longer operates the plant at South Boston. W. C. Graves is in charge of the sale.

The Universal Carbon Company has purchased a manufacturing plant at Ashland, Mass., adjacent to the works of the Lombard Governor Company, and will occupy it for the manufacture of carbon products from carbon coke burned from oil in the oil regions, where the company proposes to establish a battery of oil furnaces. The offices are now located at Ashland.

The Leach & Garner Company, Attleboro, Mass., manufacturer of jewelry, will build a new factory, 50 x 150 ft., and three stories.

It is stated by officers of the Shawmut Motor Company that a new plant for the manufacture of automobiles will be erected in Boston, to replace the works at Stoneham, Mass., destroyed by fire some months ago. No details as to location and size are available. The company has an office in Boston.

The Meriden Machine Tool Company, Meriden, Conn., has brought out a new turret lathe having 20 in. swing and power feed and possessing several interesting improvements.

Hobson & Twombly, Fryeburg, Maine, are erecting a factory in that place for the manufacture of piano frames, according to a dispatch. The main building will be 36 x 150 ft., and other buildings will be added.

The United Illuminating Company, Bridgeport, Conn., has awarded the contract for a one-story brick power house, 55 x 77 ft.

The Norton Grinding Company, Worcester, Mass., manufacturer of grinding machines, is increasing its working force as rapidly as suitable help can be secured, business having increased considerably. Large orders have been received. While an important factor in the buying is the automobile trade, new business is by no means confined to this class of customer. The orders are nearly all domestic, which in itself constitutes a marked change in this company's experience, for even during the best of the last period of prosperity more than 50 per cent. of the business booked was foreign.

The Windsor Machine Company, Windsor, Vt., manufacturer of the Gridley automatic turret lathes, reports a marked improvement in business, 140 men being employed, while the shops are running four evenings a week. One order just booked is for 14 3¼-in. machines.

The American & British Mfg. Company is issuing $500,000 of mortgage bonds, the proceeds of which will be used at the works at Bridgeport, Conn., in financing large contracts just closed with the United States government and various commercial concerns, and for the purchase of machinery to handle these contracts. No definite plans have been made as to the new equipment. The Bridgeport works manufactures field guns and projectiles, and makes a feature of gasoline engines for automobile and motor boat purposes.

The boiler makers are a good deal busier, the improvement being general throughout New England. Considerable new work is being booked, consisting largely of renewals in existing plants, and there is a satisfactory demand for special work, such as tanks.

The Noiseless Typewriter Company, 252 Asylum street, Hartford, Conn., states that there is no truth in the report that a part of the new plant recently acquired at Middletown, Conn., will be devoted to the manufacture of automobiles.

The E. Ingraham Company, Bristol, Conn., manufacturer of clocks, will build an addition to its plant, consisting of a five-story brick structure, 38 x 136 ft.

The Lamson & Goodnow Mfg. Company, Shelburne Falls, Mass., manufacturer of cutlery, has engineers at work on a project to develop water power controlled by the company for the purpose of producing electric power. Nothing is fully determined at present; it will be several months before definite estimates will be forthcoming, the company states. If the decision is to go ahead with the development power will be available not only to operate the company's factory, but for transmission elsewhere.

The Locomobile Company of America, Bridgeport, Conn.,

is planning the erection of a new building which will give 40,000 sq. ft. of new manufacturing space.

The Springfield Street Railway Company, Springfield, Mass., will spend $160,000 in improvements this season, the items including lathes, drills and presses for the repair shops, considerable new track, including special work, rolling stock and improvements to power stations.

Edwin J. Blake, Hartford, Conn., brass founder, has awarded the contract for a new foundry building, 90 x 92 ft., one story.

Work on the building of the new subway which will join Boston and Cambridge was started last week, but hardly had the preliminaries begun when taxpayers of Boston asked the courts for an injunction restraining the commission and contractor from doing that part of the work which necessitates the creation of a subway under the Common, the reason given being that an encroachment of this sort would establish a precedent threateniug the existence of that historic ground. A work entailing the expenditure of several millions of dollars was looked to as promising large buying of supplies and some equipment, and any serious delay at this time would be regretted in the trade.

The Mayo Radiator Company, New Haven, Conn., manufacturer of automobile specialties, is to build large additions to its works. A main building will be 150 x 300 ft., and there will be a box shop, 40 x 60 ft., both one story.

Landers, Frary & Clark, New Britain, Conn., manufacturers of hardware specialties, are planning the establishment of a new power plant in which they will develop their own electric power. Detailed information is not yet available.

General manufacturing projects announced through the week include the following: United States Finishing Company, Norwich, Conn., addition to its plant at Sterling, Conn., 50 x 150 ft., four stories; Stoughton Mills, textiles, Stoughton, Mass., two-story brick addition, 65 x 120 ft.; Clear Felt Hat Company, South Norwalk, Conn., two-story addition, 42 x 60 ft.; Goodall Worsted Company, Springvale, Maine, three-story dyehouse, 54 x 175 ft.; Hill Mill, Lewiston, Maine, textiles, six-story mill, 75 x 165 ft.; Westerly Narrow Fabric Company, Westerly, R. I., one-story mill, 122 x 156 ft.; Pacific Mills Corporation, Lawrence, Mass., replacing mill at Dover, N. H. A new corporation, headed by Charles M. Holmes, New Bedford, Mass., will erect a cotton mill of 60,000 spindles in that city this season. The City Mfg. Company, New Bedford, will build an addition to its yarn mill.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 18, 1909.

The general condition of the local machine tool market continues to improve slowly. Not only have sales become somewhat more plentiful than last month, but buying is becoming more general in character, machinery houses no longer depending almost entirely upon the automobile industry for orders, as they have been doing the past few months. With a general improvement in business manufacturers in various lines of metal products are beginning to come into the market. Some orders that have been pending for some time were placed last week, and there is a better volume of inquiries, although few are for more than two or three tools. Inquiries for second-hand tools have picked up and there is now a fairly good demand for second-hand milling machines, lathes and gear cutters. There is quite a scarcity of good second-hand tools.

The condition of the automobile industry in Ohio and Michigan continues very satisfactory. The capacity of nearly all the large plants is being taxed to the utmost to get out machines for this season's delivery and manufacturers of automobile parts have all the work they can do. Builders of automobiles are already looking ahead to next season and some of them are making contracts for forgings and other parts for next season's delivery. Some new automobile concerns are preparing to enter the field with motor cars next year that will have practically all their manufacturing done by outside plants, establishing plants of their own only for the assembling of parts. This additional demand for automobile parts is expected to result in the enlargement of plants now making automobile parts that already have all they can do, and the purchase of considerable additional machine tool equipment.

A better tone prevails in the general manufacturing situation. Plants are being operated at a slightly better capacity, and there are more inquiries for skilled workmen than there have been for months. Many machinists and molders have been given employment during the past week or two.

Plans are all well under way for the Cleveland industrial exposition, to be held June 7-19, and the temporary building in which some of the exhibits will be housed will soon be ready for occupancy. The Exposition Committee has alloted special days for the large and many of the small cities within a radius of 200 miles of Cleveland. Some of the special days alloted are as follows: June 10, Toledo day; June 12, Cleveland day, American Hardware Manufacturers' Association and Southern Jobbers' Hardware Association; June 14, Buffalo day, Detroit day; June 15, Pittsburgh and Youngstown day; June 16, Columbus day.

Several Canton, Ohio, manufacturers will enlarge their plants this season. The Berger Mfg. Company is completing a brick and steel building, 100 x 280 ft., which will be used for general factory purposes, and has commenced the erection of a building, 125 x 300 ft., to be used as a galvanizing department. The Canton Bridge Company has the contract for this building, which will be of steel. The Canton Stamping & Enameling Company has let the contract for its new building, which will be 200 x 275 ft.

The Kennedy Tool & Supply Company, Cleveland, has been incorporated with a capitalization of $10,000 by J. G. Fogg and others. Although the company is not yet ready to announce its plans, it is announced that its intention is to establish a plant for the manufacture of a line of tools.

The Timken Roller Bearing Axle Company is adding considerable machinery equipment to its Canton, Ohio, plant, and placed an order the past week for 14 ¾-in. Gridley automatic turret lathes.

The Lake Erie Forging Company, Cleveland, has leased a site, and will soon begin the erection of a new plant at Scranton avenue and University road.

The General Fire Extinguisher Company has decided to build a large addition to its Warren, Ohio, plant, to be used for the manufacture of hot water and steam heating apparatus. The new building will be 250 x 400 ft.

The Toledo Machine & Tool Company, Toledo, Ohio, which recently bought some additional machine tool equipment, has an additional inquiry out for four lathes, two 24-in. and two 28-in.

Milwaukee Machinery Market.

MILWAUKEE, WIS., May 18, 1909.

The principal development here during the past week or 10 days has been a noteworthy influx of orders received by the large machinery building companies, which are now operating on a basis substantially equal—from the standpoint of percentage of output to capacity—to that of the smaller shops. In one day recently local builders of engines and steam turbines closed sales aggregating over $250,000, and the most significant feature of this was the fact that the total amount was made up not of a few large orders, but of a considerable number of contracts of fair size taken simultaneously in different sections of the country. Live negotiations pending are also more numerous than they have been for some time. This applies particularly to the heavier lines of machinery. Much prospective business will still be slow in coming to a definite conclusion, but it is evident that an increasingly large percentage of projects are being rapidly brought to a head.

More than a little business is now being lost to Eastern manufacturers in consequence of the inability of some Wisconsin builders to make 30 days' delivery as demanded by prospective customers. That condition applies to power driven tools of several types, electrical apparatus, construction equipment and machinery peculiar to certain industries where the awakening activity is most manifest. To offset this a number of manufacturers, as recently reported, are putting through stock orders for standard machines such as meet with most frequent demand.

According to figures so far obtainable, April appears to have broken almost even with March in point of value of business booked, some houses reporting more and others a little less. This is rather disappointing, but the record for May thus far has been very encouraging, and everything points to a large volume of sales for the month. In the great shops at West Allis, Cudahy, South Milwaukee and North Milwaukee, the improvement is particularly noticeable.

The Menasha Paper Company has engaged Jacobson & De Guere, architects and mill engineers, Grand Rapids, Mich., to erect a large pulp mill and sulphite plant at Ladysmith, Wis. Boiler house, power plant and a large quantity of machinery are among the requirements for the new mills.

The General Construction Company, Omaha, Neb., is purchasing for one of the traction lines in that section equipment for handling freight as well as passengers. The result of this departure will be considerably extended power facilities, and additional machinery is likely to be purchased in the near future.

Additional rolling stock, rotary converters, transformers and other substation apparatus are to be bought by the Gallatin Valley Electric Railroad, Bozeman, Mont., and a contract for new car and repair barns will be let in the near future.

An order for two additional blowing engines, equipped with gas cylinders, has been placed by the Illinois Steel

Company with Milwaukee builders. These will be installed at the South Chicago Works.

The Wisconsin Engine Company is installing at Atlanta, Ga., a 25,000,000-gal. vertical triple expansion pumping engine, and the city has ordered from the Builders' Iron Foundry, Providence, R. I., a 30-in. Venturi meter of capacity sufficient to be used with this unit.

The Dells Paper & Pulp Company has temporarily enlarged the facilities of its present mill in Eau Claire by the purchase of a 300-hp. induction motor. It is reported, however, that work on the new plant at Jim Falls, including an hydro-electric development, will be undertaken shortly.

A new conveying system will probably be installed this summer by the Excelsior Brick Company, Menominee, Wis.

The Western Composite Brick Mfg. Company will build on the Menominee River in Milwaukee a three-story plant, 150 x 165 ft., and install heavy hydraulic pressure machinery.

The Allis-Chalmers Company has recently taken contracts for upwards of 30 steam turbines and generators, aggregating in capacity nearly 50,000 kw., and negotiations are now pending for more than double that number. Among the orders placed is one for a unit of 2000 kw. for the Public Service Corporation of New Jersey, to be installed at Camden; another of 2000 kw., purchased by the Stone & Webster Engineering Corporation for the El Paso Electric Railway Company, El Paso, Texas, and a 2000-kw. machine to be placed on a repeat order in the public service station of Columbus, Ohio.

An increasing demand for special track work, crossings, frogs, switches, &c., is noted by the Falk Company, Milwaukee, indicating more repair and maintenance work on the part of both steam roads and electric traction lines.

The Fred M. Prescott Steam Pump Company, Milwaukee, has received an order from the city of Waukegan, Ill., for a horizontal pumping engine of 6,000,000-gal. daily capacity.

The Gisholt Machine Company, Madison, Wis., is finding a better demand for motor driven lathes than has existed for many months past.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 18, 1909.

The situation on the whole has a somewhat better appearance. While this market has the habit of recovering from periods of depression rather slowly, the fact that things are brightening up, even though transactions are small, is taken with considerable encouragement by the trade. That railroads in some sections are more active buyers of motive power and rolling stock is looked upon as a more favorable sign; increased activity in building operations, particularly in the way of factory buildings and extensions to plants, is also considered favorable for more active conditions in the future. While industrial plants in some sections show a betterment, the iron and steel making plants in the East have been moving forward rather slowly and have, generally speaking, not been able to get above 60 per cent. of nominal capacity.

Inquiries are somewhat better; there is a more general demand and the sources are better and cover quite a wide range. Several propositions of good size are still under consideration, and there is a more optimistic feeling concerning new business, which has not yet reached the actual stage of inquiry, but is nevertheless in sight. More business in the way of power equipment is actually in sight than in strictly the machine tool field; special tools, however, have been in fair demand recently. Manufacturers of tools and equipment generally report a slightly increased volume of business, although orders are to a large extent rather irregular. The foreign demand continues weak; there is almost no inquiry for the standard lines of tools, although some business has been done in the specialties. Second-hand machinery shows a fair aggregate volume of business; the demand has been rather general, however, and covers quite a wide variety and size of tools and equipment. While there is a better demand for power equipment, competition is sharp, and low prices are reported, owing to the anxiety of engine builders particularly to get a sufficient volume of business to enable plants to be run economically.

The foundry trade continues rather inactive. While slight improvements are reported in some instances, the general foundry trade is far from being satisfactory.

The Springfield Water Company has awarded the contract for its new pumping station at Neshaminy Falls, Pa., to Herbert E. Havens, Franklin Building, Philadelphia.

Business with the Baldwin Locomotive Works increases but slowly, although it is believed that the outlook is decidedly more encouraging.

The contract for the erection of the addition to the Real Estate Trust Company Building has been awarded to Doyle & Co. Frank C. Roberts & Co. and Edgar V. Seller are the architects and engineers.

The George A. Fuller Company, North American Building, has the contract to build the new office building to be erected for the Chestnut Street Realty Company, in Chestnut street, above Broad street. The building will be 18 stories high and will be constructed of structural steel and stone. Operations are expected to be started at an early date.

The properties at the southeast corner of Thirteenth and Callowhill streets, embracing 1238 to 1246 Callowhill street and 329 to 337 North Thirteenth street, as well as several properties on Charlton street, have been purchased by Goodman, Loeb & Co., who propose erecting a large manufacturing building, plans for which are in course of preparation by Ballenger & Perrot, engineers and architects.

The Screw Cutting Company of America, formerly located at 150 Berkley street, Wayne Junction, has moved to its new plant, now completed, at Seventeenth street and Sedgley avenue, where it expects to be in full operation by June 1.

The delay in the action of City Councils of Camden, N. J., in passing an ordinance permitting the Delaware River Tunnel Company to use certain streets in that city in connection with its proposed tunnel under the Delaware River, connecting Philadelphia and that city, has delayed any action regarding the work. Some of the provisions of the proposed ordinance are unsatisfactory to the Camden authorities, and will probably have to be altered. Favorable action in some manner is expected in the near future.

The Philadelphia & Reading Railway Company is asking for further bids, which will be received until June 9 for work in connection with its elevated work on Ninth street. Tenders will be received under contract No. 4, for embankment work, trestle and masonry from Jefferson street to Montgomery avenue, while under contract No. 6 bids for bridges and viaducts ready for ballast, for the same section, will be received. Plans and specifications for this work may be obtained from W. Hunter, chief engineer, 520 Reading Terminal, upon payment of a nominal deposit. The same company has opened bids for various classes of work on another section of this elevation work, and contracts have been awarded to the McClintic-Marshall Construction Company for the structural work, the McGraw Company for the embankment work and O. J. Evers for the foundation work.

Government Purchases.

WASHINGTON, D. C., May 18, 1909.

Bids will be received until June 9 at the office of the United States Engineer, Pittsburgh, Pa., for a water power air compressor plant for the new lock 5 on the Monongahela River at Brownsville, Pa.

The Isthmian Canal Commission will receive bids until June 10, Circular No. 511, for a wood boring machine and other supplies.

The Isthmian Canal Commission will shortly ask bids for a vertical hollow chisel mortising and boring machine, 2 ton electric hoist, rotary shaper, portable pneumatic riveter, centrifugal pump and engine, portable rock crusher, heavy horizontal boring and drilling machine, belt driven horizontal punch, one 10-hp. and one 15-hp. gasoline motor, &c.

The following bids were opened May 6, Circular No. 503, for machinery for the Isthmian Canal Commission:

Class 1.—Two semi-marine water tube boilers—Bidder 3, Babcock & Wilcox Company, New York, $17,750; 30, E. Keeler Company, Williamsport, Pa., $8522 and $7516; 35, Mosher Water Tube Boiler Company, New York, $6500; 36, Motley, Green & Co., New York, $8500.

Class 2.—One air compressor—Bidder 1, Allis-Chalmers Company, Milwaukee, Wis., $10,438, including class 8, one motor; 7, Chicago Pneumatic Tool Company, New York, $5773; 26, Hall Steam Pump Company, Pittsburgh, Pa., $3175, $4425 and $4500; 28, Ingersoll-Rand Company, New York, $4378; 32, Laidlaw-Dunn-Gordon Company, New York, $4400, $4270, $4035 and $3900; 64, Jeanesville Iron Works, Hazelton, Pa., $3846 and $3740; 66, Sullivan Machinery Company, Chicago, Ill., $4225.

Class 4.—One single surface wood planing machine—Bidder 2, American Wood Working Machinery Company, Rochester, N. Y., $520; 16, J. A. Fay & Egan Company, Cincinnati, Ohio, $420; 18, Frevert Machinery Company, New York, $397; 34, Manning, Maxwell & Moore, New York, $408; 60, Fox Brothers & Co., New York, $395.45; 65, Oliver Machinery Company, New York, $409 and $673.

Class 5.—One universal saw bench—Bidder 2, American Wood Working Machinery Company, Rochester, N. Y., $527; 16, J. A. Fay & Egan Company, Cincinnati, Ohio, $460 and $590; 18, Frevert Machinery Company, New York, $434; 24, Greenlee Brothers & Co., Chicago, Ill., $554; 34, Manning, Maxwell & Moore, New York, $554; 36, Motley, Green & Co., New York, $452; 60, Fox Brothers & Co., New York, $431.79; 65, Oliver Machinery Company, New York, $397, $372, $497 and $472.

Class 6.—One 38-in. band saw—Bidder 2, American Wood Working Machinery Company, Rochester, N. Y., $413; 16, J. A. Fay & Egan Company, Cincinnati, Ohio, $420 and $475; 18, Frevert Machinery Company, New York, $489; 34, Manning, Maxwell & Moore, New York, $483; 36, Motley, Green & Co., New York, $375; 60, Fox Brothers & Co., New York, $476.89; 65, Oliver Machinery Company, New York, $269, $294, $473 and $498.

Class 7.—One 12-in. joiner—Bidder 2, American Wood Working Machinery Company, Rochester, N. Y., $300; 16, J. A. Fay & Egan Company, Cincinnati, Ohio, $255; 18, Frevert Machinery Company, New York, $444; 34, Manning, Maxwell & Moore, New York, $437; 36, Motley, Green & Co., New York, $375; 60, Fox

Brothers & Co., New York, $455.34; 65, Oliver Machinery Company, New York, $264, $280, $289 and $305.

Class 8.—One motor—Bidder 10, Diehl Mfg. Company, Elizabethport, N. J., $250; 15, Fairbanks, Morse & Co., Chicago, Ill., $278; 20, General Electric Company, Schenectady, N. Y., $270; 36, Motley, Green & Co., New York, $288.50; 51, Sprague Electric Company, New York, $288; 55, Western Electric Company, New York, $275.50; 56, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $283; 60, Fox Brothers & Co., New York, $299.89.

Class 9.—One turret lathe—Bidder 19, Garvin Machine Company, New York, $1540 and $1460; 34, Manning, Maxwell & Moore, New York, $1190; 36, Motley, Green & Co., New York, $2195; 60, Fox Brothers & Co., New York, $1261.57.

Class 10.—One turret lathe—Bidder 19, Garvin Machine Company, New York, $634 and $614; 34, Manning, Maxwell & Moore, New York, $610; 36, Motley, Green & Co., New York, $2292.

Class 11.—One bolt cutter—Bidder 18, Frevert Machinery Company, New York, $368; 34, Manning, Maxwell & Moore, New York, $389; Motley, Green & Co., New York, $400; 45, Prentiss Tool & Supply Company, New York, $381; 58, H. B. Brown Company, East Hampton, Conn., $388.63; 59, Drew Machinery Agency, Manchester, N. H., $416; 60, Fox Brothers & Co., New York, $295.

Fox Brothers & Co., New York, have been awarded class 13, one centering machine, $88.29, and class 14, one belt driven column friction drill, $45.94.

The following bids were opened May 11 for machinery for the navy yards:

Class 81.—Four engine lathes—Bidder 48, Fairbanks Company, New York, $4287; 66, Hendey Machine Company, Torrington, Conn., $4410; 88, Manning, Maxwell & Moore, New York, $4410; 101, Prentiss Tool & Supply Company, New York, $4847.30; 104, Pratt & Whitney Company, Hartford, Conn., $5876.60.

Under bids opened April 6 for machinery for the navy yards, the Pratt & Whitney Company, Hartford, Conn., has been awarded class 51, two new model engine lathes, $1361.

Under bids opened April 13 for machinery for the navy yards, the Cleveland Pneumatic Tool Company, Cleveland, Ohio, has been awarded class 104, 12 pneumatic drills, $41.60.

The following awards have been made for machinery for the navy yards, bids for which were opened April 20:

Fairbanks Company, New York, class 41, one No. 2 vertical high power milling machine, $1459.

Hendey Machine Company, Torrington, Conn., class 42, one toolmakers' lathe, $598.

Pratt & Whitney Company, Hartford, Conn., class 43, one new model turret lathe, $467.

Manning, Maxwell & Moore, New York, class 44, one 32-in. heavy duty back geared crank shaper, $928.

Orton & Steinbrenner, Chicago, Ill., class 51, one locomotive jib crane, $6250.

Lidgerwood Mfg. Company, New York, class 54, one motor driven reversible two-speed deck winch, $3175.

The following awards have been made for machinery for the navy yards, bids for which were opened April 27:

Westinghouse Air Brake Company, Pittsburgh, Pa., class 81, one steam driven air compressor outfit, $478.

Manning, Maxwell & Moore, New York, class 82, one upright drilling machine, $145.

J. B. Morris Foundry Company, Cincinnati, Ohio, class 83, one lathe, $392.

M. T. Davidson Company, Brooklyn, N. Y., class 220, four vertical simplex feed pumps, $82.50.

Under bids opened May 4, Circular No. 506A, for machinery for the Isthmian Canal Commission, the National Electrical Supply Company, Washington, D. C., has been awarded class 1, one duplex pump, $3124.25.

Mortality of Jobbing Foundries.—Reference is made by the *Foundry* to statistics of failures and withdrawals from business in the foundry industry in "one of the leading iron and steel centers." The figures were compiled by a jobbing foundryman: "During the past eight years he has kept a record of the failures as well as the number of concerns that have engaged in this line, but have discontinued operations for various reasons. The figures are startling, as they show that no less than 47 gray iron jobbing foundries, within a radius of 10 miles of his shop, passed out of existence in that period, 46 remaining to contest the field to-day. In this total are included reorganizations and sales of shops via court proceedings, many of the plants that originally failed to produce dividends being in successful operation at present under new management." Lack of system and of accurate cost accounting is considered the prime reason for so large a percentage of failures in the jobbing foundry trade.

The Bowery Mission Free Labor Bureau is prepared to supply any number of men, for any kind of labor, at a moment's notice. Within the past 12 months the bureau's cashier has paid out $1453.86 for railroad expenses on thousands of worthy, willing and able-bodied men, to all parts of the country. Address John C. Earl, financial secretary, 92 Bible House, New York City.

Trade Publications.

Brass and Iron Specialties.—Krahn Mfg. Company, Enterprise Building, Milwaukee, Wis. Catalogue, 5 x 8 in., 32 pages. Automatic multi-feed oilers, devised especially for automobiles and priming cocks, oil pump indicators, oil cups, &c., are shown, together with fittings for steam, gas and gasoline engines and repair parts for automobiles. A face cutter for screw machines designed to perform work other than plain turning or boring on a plain screw machine is also shown. This machine can be used for facing either on front or back of the work, counterboring or any operation that cannot be done with a rigid tool.

Sectional Boilers.—The Herendeen Mfg. Company, Geneva, N. Y. Booklet. Describes the Furman sectional house heating boiler which is designed for burning hard or soft coal, wood or gas. The boiler is shown assembled and in sections and is fully described.

Milling Machines.—Ingersoll Milling Machine Company, Rockford, Ill. Catalogue No. 17, 6 x 9 in., 102 pages. An unusually complete standard line of planer type milling machines is shown, in addition to a general line of milling machine equipment. Among the company's recent productions shown are two sizes of the combined knee type millers, the No. 3 and No. 5, which were described in *The Iron Age* May 6, 1909. The volume is well arranged and copiously illustrated.

Water Softeners.—Gem City Boiler Company, Dayton, Ohio. Catalogue, 6 x 9 in., 28 pages. The Russell water softener, which softens water in large quantities by chemical treatment for railroad and industrial plants, is illustrated with broken views to show the construction. The chemicals used in this apparatus are lime and soda-ash. The apparatus is minutely described.

Engine and Speed Lathes.—Sebastian Lathe Company, Cincinnati, Ohio. Catalogue No. 14, 6 x 9 in., 36 pages, and folder. Screw cutting foot lathes, engine lathes, gap engine lathes, together with the various attachments used on them are illustrated. Among the attachments shown is a new automatic turret which fits the 13 and 15 in. lathes made by the company, and can also be fitted to any lathe with a swing of from 12 to 15 in. The diameter of the turret is 7 in., and it is 4 in. high. A set of wood turning tools suitable for any lathe is shown, together with drill chucks, jaw chucks, as well as some hand and power drills and planers for which the company is selling agent. The folder shows a 15-in. engine lathe and lists the attachments furnished with it.

Lifting Magnets.—The Browning Engineering Company, Cleveland, Ohio. Bulletin No. 31. Shows the Browning lifting magnet in use for loading sheet metal, scrap, &c., into railroad cars.

Coal Elevating and Conveying Machinery.—Gifford-Wood Company, Chicago, Ill. Catalogue No. 2, 7 x 10 in., 36 pages. Coal elevators, coal pockets, chain conveyors, elevators and conveyor parts, &c., are shown, and mention is made of the company's line of ice handling machinery.

Hoisting Engines.—Williamson Brothers Company, Philadelphia, Pa. Catalogue C, 6½ x 9¼ in. Standard types of hoisting engines are shown, including a double cylinder, double drum type machine especially designed for outdoor service, a hoist which is furnished without boiler where steam is supplied from a central power service, electric hoists in a number of types and a compact portable machine especially adaptable for stevedore work which is easily moved and takes up but little room. This machine is capable of hoisting 2500 lb. and weighs 4000 lb.

Compressors, Channelers and Drills.—Ingersoll-Rand Company, 11 Broadway, New York. Three bulletins. Form 3001 contains a brief history of the development of the Ingersoll-Rand Company and describes its method of manufacturing air and gas compressors, with exterior and interior views of the company's works and sectional views of its standard compressors. Several standard types of the assembled machines are also shown. Form 6002 shows an electric-air track channeler, which is operated by compressed air furnished by a tandem single acting air pulsator driven by an electric motor and is mounted to run on rails. Form 4010 describes a telescope feed hammer drill operated by air and shows the machine in use in coal mines and quarries.

Reinforced Concrete Buildings.—Turner Construction Company, 11 Broadway, New York. Bulletin No. 7. One of a uniform series of bulletins showing concrete buildings recently erected by this company. This one contains views of an addition to the plant of the Murphy Varnish Company, Newark, N. J., and the Bush Terminal Company's model factory No. 1, in Brooklyn, N. Y.

Air Compressors.—Sullivan Machinery Company, Railway Exchange Building, Chicago. Booklet of 18 pages containing illustrations and briefly describing the line of air compressors, rock drills, diamond core drills and hoisting engines made by this company.

HARDWARE

ONE of the greatest problems of the day is to keep competition within due bounds without becoming entangled in illegal agreements to fix or maintain prices. The law does not look with favor on agreements of any kind between competing firms or companies, and many of the States have made it a criminal offense to fix prices, restrict output or sales, or to engage in any agreement in restraint of trade. There is no doubt that competition is one of the greatest forces of progress, but, like many other forces, it can do irreparable injury when it gets beyond reasonable bounds.

The merchant of to-day who is confronted with the evils of abnormal competition could profitably spend a little time in looking backward and considering the methods of the Merchant Gilds. The gild is one of the "lost arts" of commerce. America has developed so rapidly that the ranks of merchants have necessarily been recruited from the farm, the shop and all classes of citizens, wherever an individual could get together the capital necessary to start a store. As a result of this rapid growth of the country very few of the merchants now in business have had training to correspond with the old time apprenticeship; and it is this lack of experience and thorough training on the part of many business men that lies at the bottom of the destructive competition which is so common in all branches of trade. The division of labor in great factories has made it unnecessary for the ordinary workman to spend years in mastering a trade, but there is no such division of labor in managing a Hardware store. The merchant succeeds in proportion to his ability and experience as a master of his trade, and there would be fewer failures in business if some of the men who open stores had first served an old time apprenticeship.

The gild in its best form brought all the merchants of a town together in a close brotherhood in which they worked for the common good. Before the days of modern mercantile agencies and banks a man could not engage in business or gain recognition and credit as a merchant unless he belonged to the gild. He had to serve an apprenticeship and show that he had the experience and capital to carry on his proposed business before he could gain admission as a member, and this wholesome custom made failures an almost unknown occurrence in trade. It was one of the customs of the gild for other members to come to the assistance of any one who, for reasons beyond his control, was unable to meet his obligations. Carthage, the great center of the commerce and "lost arts" of ancient civilization, made treaties in which the government guaranteed the payment under certain restrictions of the foreign debts of Carthaginian merchants; and in the Middle Ages it was a common custom for the gild members of one city to make good any obligations of a member for goods purchased in other cities. The spirit of individualism which prevails in modern trade, especially in the United States, is too strong to be harmonized at this late day with the old methods of gild regulation. A large proportion of merchants to-day will not join any association, even of the mildest form, because it is against their principles, and they are often the most troublesome, reckless and unprincipled as competitors.

While the "lost art" of the merchant gild may never be re-established in America, many of the benefits of the system may be enjoyed without restricting personal liberty. The Hardware merchant who wanted his competitor to join the State Association and attend its conventions because it would help them to get along better together touched the root of the question. Where men are brought together in friendly social relations they will generally be less disposed to engage in unfriendly commercial practices, especially of a character which are unprofitable to all parties concerned. Destructive competition cannot exist where men have the opportunity to discuss together in a friendly way the methods and practices of their trade, and it is only the destructive, malicious form of competition that makes trade unprofitable.

Practically all the customs of to-day which go under the general term of fair dealing or honor in business are old gild customs. The gilds educated men to deal fairly and honorably with each other and with the public, and the merchant of to-day owes them a great debt for establishing the customs which make it possible to obtain and give credit. A man can do business with both hands now, but if it were not for the gild customs, that have become recognized as law, it would be necessary to carry a gun in one hand, do a strictly cash business, and sleep in the store.

A respectable business man does not seek to injure a competitor by throwing bricks to break his windows or damage his goods, because people have been educated to look with contempt on such conduct. This education can be extended almost indefinitely to cover the petty and foolish ills of trade, if they can get together and discuss them and establish for themselves the proper course of conduct. If there was a local association of merchants in every town and city whose primary purpose was to discuss and promote "good manners" or honorable conduct in business the percentage of failures reported by the mercantile agencies would be greatly reduced.

Condition of Trade.

The development of overshadowing importance since our last issue has been the sudden withdrawal of the lower prices on Wire products made but a scant three weeks ago, and the announcement of an advance in these commodities of $2 per ton. It is generally understood that this action on the part of the leading interests came as something of a shock to many buyers who had by no means completed the purchases which they desired and intended to make. To the trade as a whole, however, the quick recovery from the low level is most encouraging, indicating, as it undoubtedly does, that the object of the reduction was attained even more quickly than was anticipated, restoring confidence in the stability of the market and bringing in a very large volume of specified orders for early shipment. The effect of these occurrences on the general business situation cannot be otherwise than beneficial. Sentiment is usually based to a large extent on the action of the staple markets, and a healthy and promising condition in at least one important quarter is indicated by the event cited. There remains but little to chronicle in addition to what was said in this column a week ago. Business, especially among the larger trade, is not in sustained good volume, but continues to show reasonable improvement. The jobbers in nearly all localities are enjoying a good trade and

finding much encouragement for prosecuting their business with aggressive vigor. Seasonable goods are said to be moving well in most sections.

Chicago.

After months of yielding weakness, in which prices have been constantly settling to lower levels, the market has apparently reached the turning point, with good prospects for a reverse movement which in time may be relied upon to restore a safe equilibrium. While no violent upturn is anticipated, nor, indeed, is desired, the outlook affords much encouragement and a more buoyant feeling prevails. The process of readjustment has been slow and tedious, but it has gone on steadily until its accomplishment is pretty generally realized. Practically all commodities comprised in Hardware stocks have been brought into harmony with the new alignment, and as a net result of it all a firmer basis for upbuilding has been established and the hampering influence of distrust is giving way to fuller confidence. For the past two weeks interest has been centered upon Wire and the leading Wire products. Since the announcement on May 3 of the reduction of prices trade in these lines has been rapidly increasing. The demand for the past week has been especially heavy. Orders have been pouring in from every quarter, and despite the fact that specifications are required with each purchase, buyers are ordering in liberal quantities. Something of the remarkable expansion of the low prices now ruling may be judged from the fact that bookings of the leading interest for a single day have overrun 20,000 tons. So prompt and general has been the acceptance of the new price schedules as representing the extreme limit likely to be reached, that it is believed the bulk of requirements in heavy Wire goods for the spring trade have been covered by orders already placed. Rumors current of an impending advance are accepted in many quarters as reflecting the probable force of action likely to be taken at an early date. Trade in other lines of Hardware has been to some extent sympathetically strengthened by the quickened movement of Wire products. Shipments of seasonable goods such as Garden Hose, Lawn Mowers and Refrigerators are increasing in volume. Some of the Refrigerator factories are already being pressed for deliveries, and the demand bids fair to equal that of any normal season.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—While we continue to show gains over last year, and April and May have proved to be no exceptions, still it must be admitted business is spotted—very much better in some parts of the country than in others, and also better in some sections of certain States than in other sections.

Generally speaking, business in the Northern States is better than business in the Southern States. So far this has been rather an "off" year for the South. The Southern States were the last to feel the effects of the panic and they seem to be the last to recover.

Since the cut in the price of Nails and Wire there has been a revival in business on these goods. We understand both jobbers and retailers are placing heavy specifications in anticipation of an early advance. We hope they will not be disappointed.

Just at present our business is characterized by a large number of orders of moderate size. In numbers, our orders are running far in excess of last year. It is evident that the retail merchant continues to buy carefully and conservatively and that he appreciates the advantage of drawing from his jobber's stock in moderate quantities just as he needs goods. A large number of small mail orders, covering a great variety of goods in every department of the business, is also a feature of trade at present.

While the season has been cold and late, nevertheless we are not receiving many complaints about crop conditions from our salesmen. Certain sections of Texas continue to suffer from drought, but we are advised these sections are a comparatively small part of the State. In central, eastern and northern Texas crop conditions are better than for a number of years. It is reported there is a splendid wheat crop made in the Panhandle.

The strawberry crop is better than it has been for years. Strawberries in this market are of excellent quality and very low in price. This promises to be a good year for fruit, as the recent cold snap is said to have done very litle damage and we are now past the time when there is any more danger from frost.

Both spring plowing and spring planting, on account of the lateness of the season, are behind last year. This is the season of the year when we expect to have all kinds of thrills as a result of the varying reports of crop conditions.

While we know some of our friends in the trade are somewhat pessimistic, still, judging from our own business and the conditions as reported to us by our salesmen and customers, we see no reason for not feeling fairly cheerful and optimistic at the outlook.

Vacation time is now approaching, and the managers of all large houses will be figuring out how to take care of the work while they are shorthanded in the various departments on account of vacations.

There is no doubt that the annual vacation is a great institution—it is a good thing—but it does seem that those people who need it least get the longest vacations, while the fellow who really should have a rest seems to miss out. We suppose these things follow the Scriptural statement to the effect, "To him who hath shall be given, and from him who hath not shall be taken away even that which he hath."

Philadelphia.

SUPPLEE HARDWARE COMPANY.—In reviewing conditions for the past fortnight, the thought that comes up most prominently is how much better they might have been if the tariff issue had been decided and the intricate machinery of commerce released from the clogging and friction which the long drawn out discussion has entailed. It is beginning to appear evident that this influence is less deterrent than we have been accustomed to believe, and there is evidence that the mighty forces underlying the commercial prosperity of this country can no longer be held in check by the struggle of diverse interests at Washington.

The much derided statement of that bluff old soldier, Hancock, that the tariff was a local issue, has gained increasing support as the years have rolled on, and the successive struggles of our legislators with the representatives and delegations from the various localities of this great country have been spread before us day by day in the local prints. Surely, nothing is truer than that the tariff is a local question, made up to benefit the various localities that grouped together make this Republic.

Its value to the country at large cannot be appreciated unless we fully realize that the interest of each member is important to the welfare of the whole. It is, therefore, unwise to indulge in any sarcasm over the efforts of our Southern friends to protect the rice industry because only a small section of the country is directly benefited by its cultivation, or to single out any one industry and condemn its right to protection because only 5 per cent. of our total population are directly benefited by its prosperity.

On the other hand, it is hardly an argument to claim that the manufacturers themselves are chiefly benefited and forget the wage earner, whose value depends upon the demand for his services, and to feel that he could possibly buy his socks at 5 cents less per pair if the tariff were reduced, forgetting the important fact that the socks would not be made in this country and that whatever portion of his wages was paid out for them would be spent across the water.

It is cheerfully conceded that manufacturing can be done more cheaply abroad with our present wage schedule, and that if we are driven to compete with Europe, Asia and Japan, we can easily do so provided we can reduce the cost of labor. But what sane American wants to see labor reduced? Surely, not the farmer, for the laborer is the chief consumer of his products, and if he is driven out of the ranks of the consumer by having less

work to do, or not as much money as he now has to spend, the farmer will have to take less for his product, and will find his own ranks invaded by others who will produce what he now sells and so reduce the selling prices of all farm products.

But we will stop the discussion right here, because one can hear a chorus from those who read these articles, saying: "You can't get up any argument with us on this view of the tariff question." The Hardwareman, as a rule, has had too many practical demonstrations of the value of protection to doubt its importance to this country as a whole.

There are no lack of signs to indicate that prosperity is coming forward with increasing strength. The bank clearings for the past four months are 30 per cent. greater than they were in a similar period of last year. The report of building permits issued in 44 cities in April last show an increase of 60 per cent. over the same month in 1908, this city standing third in the list, with a gain of 68 per cent. This is one of the surest indications that the fear of impending disaster has been removed, and the belief that we have passed beyond the time when labor and materials can be bought at lower prices.

One of our great railroads, the Pennsylvania, reports a loss of only 7 per cent. in its passenger traffic in 1908, but even little things connected with its management show its returning prosperity. For many years the care it gave to the appearance of its engines and passenger coaches was matter of remark. During 1908 its policy of retrenchment involved the discharge of those who cleaned the outside of its coaches. The only work of this sort done was to the space containing the number. Recently the old-time appearance of cleanliness has been restored by the re-employment of the force who polished the outside, and the same is noticeable about the stations and along the tracks.

It is gratifying to note the statement appearing in this morning's papers that of the 150,000,000 passengers carried by the Pennsylvania system, not one life was lost as the result of a railroad wreck during the past year—a record unequaled in this country.

Local business is taxing the capacity of the jobbers to keep up with the demand for seasonable goods, the weather in this territory having been exceptionally favorable.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Trade conditions in the trans-Missouri region are normal and satisfactory. Business keeps up remarkably well. Stocks in the hands of retail merchants are well assorted, but not large. It requires constant buying in small lots to keep the assortment as it should be; consequently orders received by jobbers are very numerous. This shows a conservative spirit exists, with the idea of doing a maximum volume of business with a minimum of stock on hand.

The Hardware market is comparatively featureless, and as most lines appear to occupy a fairly firm position it is very likely that values as a rule will remain about where they are for some time.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The Hardware business is keeping up well in this part of the country, although we can begin to see some slight indications of the usual summer dullness coming on. From present indications the volume of sales for May will be from 20 to 25 per cent. ahead of last year, which will make a very satisfactory showing.

The sensation of last week in Hardware circles was the slump in Nails and Wire. The trade seems to fully realize that this is only a temporary matter and that present prices will hardly last more than a few days, and they are certainly taking advantage of it. We have had the largest business on Nails this week that we have had for many months; the inquiries and orders for carloads and less have come in by mail, telephone and telegraph. We understand that the American Steel & Wire Company will advance prices on these products within the next few days.

Crops in the South are all looking up to the average and prospects for fall trade are getting better every day. Collections are good.

Portland, Oregon.

FAILING-MCCALMAN COMPANY.—As usual the writer is exceedingly optimistic concerning conditions in this territory, and we believe that our optimism is fully justified of facts. All business here is exceedingly good and bids fair to be better as the season opens up. Our crops promise well and we hope to get a high price for them. All the producing industries in this territory are in good condition, excepting only the lumbering interests, and we hope that when the tariff makers have finally ceased tinkering with the lumber schedule that these interests will also become prosperous. At present the lumber producers are waiting to see where they stand.

We hope to see many Hardwaremen out on the Pacific Northwest this summer, taking advantage of the extremely low rates from the East to North Pacific points on account of the Seattle Fair. This Fair, with its exhibition of the resources of the Northwest and of Alaska, will undoubtedly be a revelation to many Easterners, and if they will only follow it up with visits to the other points in the Northwest—Spokane, Tacoma and Portland—they will have a better idea than ever before of the wonderful undeveloped resources of this country.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The high dive of the leading interest in Wire and Wire Products has opened up the diversion season a little ahead of time, though after a series of bump the bumps it is something of a relief to have the other fellow perform. What a splash it made. *Facile decensus*, but it has brought about what no amount of resolutions in the prosperity conventions could do. It has started buying at a great rate. People want Wire and allied supplies apparently for family consumption, who have been able to subsist on beans and soda water up to now.

The proverbial scamper to get into the political "band wagon" just preceding an election cannot be more marked than the general effort on the part of buyers, large and small, to provide the country with Plain and Barbed Wire, Field Fencing, Bale Ties, &c. Every one believes now that the next move is bound to be an upward one, and, as a consequence, there is eagerness to get supplies. It really looks at last as though the most sanguine expectations might be realized.

The farmer does not hesitate to buy what he wants when he is getting considerably over $1 for his bushel of wheat, or 10 cents a pound for his cotton. There will be no trouble filling up the tonnage of the largest mills if the crops are good and prices hold. There is a profit in sight. This plunge was just what was wanted to give things an impetus and set minds working the other way. Factories are not looking with favor on long time contracts either—an unmistakable mark of independence. What is taken has to be taken now or at the convenience of the shipper. It is, as has been expressed, "bargain day" on the counter of the great staple goods.

The tariff is dragging along and nobody has a definite idea of where it will bring up. The newspapers, instead of shedding much light on this, take up more and more room in their headlines with repeating the left handed compliments bestowed by Senators upon each other.

Let us be thankful that there are no wars or rumors of wars at present. The nearest approach we have had is the fear of a strike on the part of the French mail and telegraph clerks. This sort of a strike we do not believe the French public will stand for. When a letter carrier, for example, goes into the service he gives in his allegiance to the Government, as his is a governmental function. His recourse is to resign if things do not suit, and not to undertake the assumption of duties which belong to the Government only. It is just as well to have a demonstration made of this sort, however, so that society can arrange for its own proper protection as against any one set of men, the victims of a mistaken theory.

Cleveland.

W. BINGHAM COMPANY.—Confident of the future, large railroad companies are now investing in rails, engines, freight and passenger cars and generally rehabilitating their whole lines, anticipating in the near future that the large business that we have all been expecting will come to them in such volume as will make it necessary for them to be prepared for same. With the advent of the new administration the large corporations all over the country have taken on new impetus and views, and we believe that the future months of this year will be very propitious.

Generally a slump in price on any staple commodity curtails sales for a short time—that is, until people get used to the change—but the drastic cut that was made on Wire and Nails and other commodities has had a wonderful effect and has accelerated and increased the demand for these commodities in very large volume. However, it is announced by the large corporations that the present prices are only for immediate specifications and shipment. They are looking for higher prices in the near future and do not intend to be loaded up with any large orders for low priced goods. So it would seem it is quite safe for every one to buy liberally or what they can reasonably dispose of in the near future. We do not advise speculation on this line of goods, but stocks are so miserably low it would seem as though there must be an immense volume of these goods required to replenish them.

The same is true of many lines of manufactured Hardware. There is not an overstock in the factories or in the hands of the jobber; although their stocks are fairly well assorted, no great amounts are stored. It looks very much with the impetus the trade is now having as though it will be a question of "Have you the article in stock or how soon can you ship?" rather than "How low are you going to sell or how small an order can I give you to get the price you quote?" We feel quite optimistic in regard to trade in the coming months. Our trade in general is very good at the present time.

Prices for the most part are steady. There is no great disposition to cut prices; in fact Hardware commodities of all kinds are very low and it would not take very much of a demand to induce the manufacturers to scale up prices rather than scale them down.

On the whole, trade and traffic in this section are quite satisfactory.

NOTES ON PRICES

Wire Nails.—On May 15 manufacturers announced an advance in the price of Wire and Wire products of 10 cents per 100 lb., taking effect on that day. While the trade expected an advance in the price of these lines, the announcement came somewhat sooner than was anticipated. Manufacturers have refused to accept contract orders or otherwise to protect customers against a possible advance, and have insisted upon specifications accompanying orders, but demand has been so large that mills have all the business they can handle for some time. Liberal orders have been accepted by manufacturers for Nails and Wire, but buying for speculation has been discouraged wherever it has been recognized that orders exceeded the legitimate requirements of purchasers. With the large amount of business booked by the mills there is a possibility that shipments on the more recently placed orders may be somewhat delayed, even with mills operated at full capacity. At the recent advance of 10 cents per keg, prices are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.70
Carload lots to retail merchants	1.75
Less than carloads to jobbers	1.75
Less than carloads to retail merchants	1.85

New York.—Demand has been more active at the reduced prices, but the advance on May 15 of 10 cents per keg resulted in a falling off in orders. Many of the larger retail merchants who had been ordering for immediate requirements have taken advantage of the lower prices to place orders for carloads. The market has hardly had time to settle since the advance on the 15th inst., but Nail houses are generally holding small lots at store at $2 per keg, base.

Chicago.—An advance of $2 a ton, or 10 cents a keg, on Wire Nails, effective May 15, is announced by the American Steel & Wire Company. This action follows a cut of $7 a ton made two weeks ago. In the meantime, a very heavy tonnage was booked by the mills. Jobbers and retailers lost no time in placing their orders which were, in most cases, gauged to cover the estimated needs of the season, at least. In fact, the large volume of business that came out in response to the low prices points to some speculative buying. From now on to the end of the present season, therefore, not much is looked for in the way of new orders as compared with what has been placed. With the tonnage of specifications now on hand, the mills will be compelled to operate at full capacity to satisfy the demand for shipments. Revising prices, we quote as follows: $1.88, Chicago, in car lots to jobbers, and $1.93 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—As generally anticipated by the trade, the low prices on Wire products put into effect on May 1 were not allowed to remain in force very long, an advance of $2 a ton having been announced by the American Steel & Wire Company, Pittsburgh Steel Company and other interests, effective on May 15, making the minimum price of Wire Nails $1.70, f.o.b. Pittsburgh. As soon as the reduction to $1.60 per keg was announced by the mills, orders commenced to flow in at an enormous rate, until the mills were literally swamped with business. The trade fully realized that this price would not remain in effect very long, and covered for as many Nails as possible, with the result that the mills are filled up for the next month or two, and possibly longer. None of the Wire Nail mills would accept contracts for delivery ahead, but entered all orders for shipment at convenience of the mill, and in a great many cases orders for Nails sent in were scaled down one-half or more. It is not improbable that a further advance may be made within a short time, as we are advised that some business has already been placed at the new price of $1.70 per keg, but it is not improbable that the advance will check new demand to some extent, and it is also true that the trade has pretty well covered for some little time ahead. All the mills of the leading Wire Nail interests are being operated at practically full capacity and order books are filled. We quote Wire Nails in carloads and larger lots at $1.70, f.o.b. Pittsburgh.

Cut Nails.—Manufacturers of Steel Cut Nails complained of lack of profit in meeting the base price of Wire Nails when the jobbers' carload price was reduced to $1.60. No change in quotations of Cut Nails has been made since May 15, when the price of Wire Nails was advanced 10 cents per keg. Cut Nail manufacturers have not been soliciting business at recent prices, and what concessions can now be obtained from the regular carload quotation of $1.80 per keg, base, f.o.b. Pittsburgh, will have to be demonstrated by market conditions. The above price has been shaded 10 to 15 cents per keg.

New York.—There is a very light demand for Cut Nails in the local market, but on such business as is being done small lots at store are held at $1.95 per keg, base.

Chicago.—No official announcement of change in the price of Cut Nails has as yet been reported, but as a natural result of the recent heavy cut in Wire Nails, prices are weaker. The demand continues light, and the mills in quoting treat each transaction individually upon its merits. Slight concessions have been made from the prices quoted, which are as follows: In car lots, to jobbers, Iron Cut Nails, $2; Steel Cut Nails, $1.80.

Pittsburgh.—As yet no definite announcement of a change in prices of Cut Nails has come from the mills, but in view of the advance of 10 cents per keg in Wire Nails, effective May 15, it is not probable that a change will be made in Cut Nails. Demand is reported to be more active than for some time, and several of the leading Cut Nail mills in the Wheeling District are running

practically full. The official price of Cut Nails for some time has been $1.80 per keg base, f.o.b. Pittsburgh, but this has been shaded from 10 to 15 cents per keg. It is probable that concessions in prices of Cut Nails will be harder to obtain in the future, and will be smaller in view of the advance in Wire Nails.

Barb Wire.—In conformity with the advance of 10 cents per keg in the price of Wire Nails on May 15, the price of Barb Wire was advanced $2 per ton. Following the reduction in price of May 1 the mills booked a very large tonnage, the trade taking advantage of the low price to order liberally. At the recent advance quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots	$1.70	$2.00
Retailers, carload lots	1.75	2.05
Retailers, less than carload lots	1.85	2.15

Chicago.—The advance of $2 a ton announced by the American Steel & Wire Company as effective May 15 applies equally to both Barb Wire and Staples. It was strongly intimated after the recent decline that an early advance might be expected, and although the Fencing season was well advanced, a large amount of tonnage was immediately placed at the low prices. Recent purchases have not only pretty fully anticipated the needs of the present season, but it is believed that a good many buyers stocked up ahead at the attractive figures offered. We quote revised prices as follows: Jobbers, Chicago, car lots, Painted, $1.88; Galvanized, $2.18; to retailers, car lots, Painted, $1.93; Galvanized, $2.23; retailers, less than car lots, Painted, $2.03; Galvanized, $2.33; Staples, bright, in car lots, $1.88; Galvanized, $2.18; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Effective May 15, the makers announced an advance of $2 a ton in Barb Wire, due to the enormous amount of new business placed with the mills after the recent heavy cut was announced, effective on May 1. New orders flowed in at a tremendous pace, and an advance in prices was the logical outcome. The mills still adhere to their policy of declining to take contracts, all orders entered being subject to shipment at convenience of mill. We understand that makers of Barb Wire are filled up for the next month or two or longer. We quote $2 for Galvanized and $1.70 for Painted, f.o.b. Pittsburgh.

Plain Wire.—The advance made in the price of Wire of $2 per ton on May 15 also applied to Plain Wire. Orders at the reduction of May 1 had been coming in large volume, as the trade anticipated that the low price would not remain in force for any length of time. The base price now applies to Nos. 0 to 9, instead of Nos. 6 to 9, as formerly. The regular schedule is as follows, f.o.b. Pittsburgh, subject to the usual terms:

Nos.	0 to 9							
Annealed	$1.50	1.55	1.60	1.65	1.75	1.85	1.95	2.05
Galvanized	1.80	1.85	1.90	1.95	2.05	2.15	2.55	2.65

Chicago.—Plain Wire was included in the advance of $2 a ton, announced as effective May 15. Manufacturers and jobbers bought heavily during the past two weeks, and, since only orders with specifications for early shipment were accepted, the mills have a large amount of specified tonnage on their books. Active operations of the mills at full capacity and heavy shipments will be required to execute and deliver the orders taken. Revising prices, we quote as follows: Car lots, to jobbers, $1.68, base, f.o.b. Chicago.

Pittsburgh.—The anticipated advance in prices has been announced by the leading makers and is $2 a ton, effective from May 15. When the recent cut in prices was made it was expected that it would not remain in effect very long, and this has been realized. Very heavy new orders were placed with the mills, and they are filled up for the next month or two, and in a great many cases cut down the tonnage ordered by customers, who were evidently trying to cover ahead as far as possible. It is probable the advance in prices will check demand to some extent, and it is also true that leading consumers have pretty well covered for some time ahead. We quote Plain Wire at 1.50 f.o.b. Pittsburgh, in carloads and larger lots.

J. Stevens Arms & Tool Company.—The J. Stevens Arms & Tool Company, Chicopee Falls, Mass., is announcing that it has reduced prices on its Nos. 14, 15, 15½, 16, 16½, 17, 18, 19 and 20 Rifles, and jobbers are now in a position to furnish these goods to Hardware and Sporting Goods merchants at reduced cost. It is stated that the revision will not cause a reduction in the merchants' profits, but it is hoped will enable them to increase their sales.

Window Glass.—There is nothing encouraging in the Window Glass situation to record, as demand has fallen off again. The purchase of Glass has been discouragingly light during the spring, both East and West, though in the West consumption has been larger than in the East. The directors of the Imperial Glass Company, while not giving up hopes of perfecting the organization some time, see no way at present of inducing manufacturers who have so far refused to identify themselves with the movement to change their attitude on the subject. More Glass is being made now than can be marketed and some factories, it is understood, do not expect to shut down during the summer months. It has been pointed out that there are over 6000 skilled Glass workers in this country and enough plants to employ all of them; also that if the Imperial Glass Company was formed and closed down half of the hand operated factories to reduce production and advance prices, that the idle workmen could induce capital to start some of the idle factories and would soon demoralize the market by cutting prices to move their product. The possibility of such conditions does not brighten the outlook for the Window Glass industry. Quotations for Greater New York, from jobbers' list, October 1, 1903, are 90 and 35 per cent. discount on single and 90 and 40 per cent. discount on double strength Glass. Outside Greater New Yorrk discounts are 90 and 40 on single and 90 and 45 on double. The American Window Glass Company's discounts on machine made Glass, from manufacturers' list, January 1, 1901, are 90 and 40 per cent. on single and 90 and 40 and 10 per cent. on double. No orders are accepted by this company for shipment later than July, 1909. Hand operated factories are supposed to be meeting the discounts quoted by the American company.

Binder Twine.—According to official reports up to a week ago the standing winter wheat represented 2,478,000 acres less than that harvested last year. On this basis it is calculated that at least 3000 tons less Twine will be needed to bind wheat than last year. No preliminary official report has been made of the acreage of oats, but unofficially it is estimated that the increase is not so large as was indicated a month ago. Buying during the past 30 days has been moderate, owing to the absence of favorable reports on the condition of wheat and the weakness of the fiber market. There appears to be little doubt that considerably more than 50 per cent. of the Twine that will be required has been contracted for. Regular schedule prices are reported as being generally adhered to, as follows:

	Cents per lb.
Sisal	7½
Standard	7½
Standard Manila (550 ft.)	8
Manila (600 ft.)	8¾
Pure Manila	10

Carloads are ¼ cent less; 5-ton lots, ⅛ cent less; fall terms; central delivery. For delivery at Missouri River and Northwestern distributing points ¼ cent is added.

Rope.—Demand is moderately good, but inclined to be somewhat spasmodic. The aggregate of the business done by manufacturers makes a fair showing, taking into consideration general conditions. Pure Manila Rope of the highest grade may be quoted at 8½ to 8¾ cents per pound, according to quantity and class of trade, but Pure Manila of somewhat lower grade can be bought for from ¼ to ½ cent less. The market on good Sisal Rope may be represented by a quotation of 7 to 7¼ cents per pound. Jute Rope, ¼ in. and up, No. 1, is quoted at 6¼ to 6½ cents, and No. 2, 5¼ to 5¾ cents.

Linseed Oil.—Card prices were advanced 1 cent per gallon on the 18th inst., owing to the strong situation of

Flax Seed, the prices at Duluth having reached $1.73 per bushel on track and $1.72 for May option. Flax Seed is becoming scarce, and some crushers have closed their plants owing to lack of Seed. Others more fortunate in having fair stocks of Seed on hand are in a position to accept contract orders for Oil. Demand is fair, covering nearby requirements. Advanced quotations in 5-bbl. lots are as follows: State and Western Raw, 56 cents per gallon; City Raw, 57 cents per gallon. Boiled Oil is 1 cent advance on Raw.

Spirits Turpentine.—The market is stronger and higher than last week owing to larger buying by paint and varnish manufacturers and exporters. Receipts at Savannah have not been up to expectations. The New York market is represented by the following quotations: Oil Barrels, 41 to 41½ cents; Machine Made Barrels, 41½ to 42 cents per gallon.

Death of Stephen Thorn Fox.

STEPHEN THORN FOX of the firm of W. B. Fox & Brother, 21 Warren street, New York, died Monday night, May 17. He was stricken at his desk in the office only a few hours before. Mr. Fox was 68 years old and was very well known in the Hardware trade. He was a grandson of Judge Stephen Thorn, a prominent citizen of Dutchess County. Early in life he started in the Hardware business in Poughkeepsie, N. Y., and later came to New York City and traveled for P. & F. Corbin and Sargent & Co., by which houses he was highly esteemed as well as by the customers in his territory. Later he and his brother entered the purchasing business, forming the firm of W. B. Fox & Brother, which has represented many prominent Hardware houses and has borne a high reputation in the trade for many years. Recently Mr. Fox had devoted his attention to the export department of the business.

LETTERS FROM THE TRADE.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

"Dictated but Not Reread."

To the Editor: I notice in your issue of April 22 some comments from a manufacturing concern's house organ on the use of the rubber stamp, "Dictated, but Not Reread," and wish to take decided exception to the writer's position.

On the surface, of course, the writer's criticism is just, but this firm uses that form occasionally in the case of some members of the firm who have outside business or things in connection with our warehouse where we after dictating are called out for perhaps an hour or two and possibly not to return that afternoon, or certainly not before the mail should be sent. In such cases the letter is given to a trusted stenographer with instructions to use that stamp, merely as a precaution that in case some word or phrase may have been misunderstood and should give a false impression it is susceptible of better explanation than if the letter was sent out and marked with the initials, when the party who dictated it had not seen the letter.

It seems to me that we are entirely justified in using such a stamp. More than that, when our firm receives, as they do, many such letters it is thoroughly understood, and think there is just cause for such a business custom. JOBBER.

W. C. HELLER & Co., Montpelier, Ohio, a few days since opened a branch house in Kansas City, Mo., at 220-226 Wyandotte street, to accommodate an increasing business in Southwestern territory. They will have 15,000 sq. ft. of floor space, with a display room, 50 x 100 ft., for carrying and exhibiting a complete stock of all goods manufactured by them, which includes comprehensive sets of Hardware Shelving, all ready to set up in a store; Steel Hardware Shelf Boxes, Mice-proof Seed Cases, Screw and Bolt Cases and Special Cases to order for any use.

Georgia Retail Hardware Association.

(By Telegraph.)

VALDOSTA is giving a hearty and cordial welcome to those attending the fourth annual convention of the Georgia Retail Hardware Association now in session. This beautiful city of growing commercial importance is thus making a very pleasant impression on the members and visitors, while the business of the gathering promises to be of exceptional interest. Even at the opening of the convention there was a fine company of merchants present with a large delegation of jobbers and manufacturers, either in person or in their traveling representatives. The local trade and all the members of the reception committees were unremitting in their attentions.

The First Session.

The session of Tuesday morning was devoted mainly to the addresses of welcome and to the appointment of committees immediately related to the work of the association. The committees on Nominations, Place of Meeting, Grievances, Auditing, Resolutions and By-laws and Constitution were thus appointed so that their work may be taken in hand promptly. The report of the efficient secretary and treasurer, E. E. Dekle, was also presented. It was a model of brevity and clearness, and showed a very satisfactory progress of the organization during the year, the membership having more than doubled during that time.

The principal feature of the meeting was the extending of welcome to the association and the responses on behalf of the visitors. After the invocation by Rev. R. W. Wallace, the official welcome on behalf of the municipality was extended by the mayor pro tem., H. R. Ousley, to whom R. W. Hatcher of Milledgeville made a graceful and eloquent reply. He was followed felicitously by W. E. Thomas of Valdosta, who extended the welcome on behalf of the Hardware trade of the city.

The Afternoon Session.

In the afternoon the second session of the convention was held with a large attendance of manufacturers, jobbers, traveling salesmen and retail merchants, the meeting being an open one to which all were invited. After the calling of the roll the annual address of President C. W. Tillman of McRae was presented. It was a clearcut and forcible statement of the work of the association, with appropriate reference to some of the matters which will receive attention during the convention. It was evident that the report was heartily approved of by the members, who hold Mr. Tillman in very high regard.

An address also was made by R. R. Williams, Hardware editor of *The Iron Age*, on "The Usefulness of the Trade Press to Hardware Merchants."

New Officers.

The report of the Nominating Committee was next presented, was unanimously adopted, and the following gentlemen were elected to the respective offices for the ensuing year: President, E. E. Dekle; first vice-president, E. W. Hatcher; second vice-president, C. W. Woodruff; secretary and treasurer, C. A. Stewart; insurance manager, W. R. Hatcher. Mr. Dekle, the new president, was conducted to the chair and made a brief and appropriate address. The convention thus opens under very favorable auspices, with a prospect that it will be largely attended and very useful.

THE WATER POWER PRIVILEGES of W. M. Mooney & Co., manufacturers of Horse Nails at Ausable Chasm, N. Y., have been acquired by a company which has been organized to build a large electrical plant there. The firm states that its Horse Nail business may be slightly interrupted for a few weeks, but will eventually be continued under exactly the same conditions as heretofore.

Are Lightning Rods a Protection?

Early Devices Were Dangerous—Tricks of the Rod Swindlers—Scientific Rodding Overcomes Objections—Some Examples of Rod Efficiency—Building Disfigurement Unnecessary.

BY PROF. JOHN PHIN.

When Franklin proved that the lighting flash was merely an electric spark on a gigantic scale, and suggested that by means of a metal rod the electricity or lightning might be conveyed through or past a house to the ground without inflicting any damage, the enthusiasm in favor of lightning rods became intense. Every householder that could afford it put up a rod upon his building, and during the early part of the last century it was rare to find a house that did not bristle with gilt or silvered points, some of them of the most grotesque construction.

Innumerable Devices Were Contrived

for points, "dispersers," and even for the rods themselves, and as the general principles of electrical action were not very generally understood at that time, some of the most curious and worthless devices were patented, and fortunes made out of their sale. Of course, the ubiquitous agent or drummer was very much in evidence, and every rural district was infested with lightning rod agents, whose sole object was to get the money of the farmer and the country storekeeper by hook or by crook. These men were glib talkers, even if they did not know much about the science of electricity, and in many cases they were deliberate swindlers. Farmers being in general ignorant of the tricks of these men, signed contracts or orders which they supposed to be in accordance with the verbal bargain which they had made, and when the settlement came they found that where they expected to pay $50, the contract called for hundreds. The trick consisted in their being induced to give an order for the "rodding" of the building in a "proper" manner at so much per foot. The verbal estimate might be for 100 ft. or so; the actual measurement would often be 10 times that, and as the agent was constituted the sole judge of what proper "rodding" meant, the house owner had no escape from the payment of the bill. And this was not the worst of it. While the rods, points, insulators, &c., were showy and apparently expensive, the arrangement and the earth terminals were in general worthless, and as a consequence the lightning rod was worse than useless; in some cases it was positively dangerous. The number of cases in which the lightning rod failed to protect the building to which it was applied became so great that all faith in such means of protection was destroyed. The ignorance or worse of the ordinary lightning rod vendor was very well shown in the case of a rod which had been placed upon a hotel at a seaside resort on the coast of New Jersey. The building was seriously injured during a thunderstorm, and the writer was asked to examine the case. He found that not only had most of the modern scientific rules been violated, but the lower part of the rod had been made to end a couple of feet below the surface in dry sand—about as good an insulator as could be found. Such a lightning rod was worse than none at all.

Worthless Devices.

An Opportunity for Swindlers.

Not Only Useless but Dangerous.

Lightning Rods Discredited.

It is no wonder then then during the last 30 or 40 years a reaction has set in; the ordinary builder, architect and house owner has lost faith in lightning rods, and we rarely see one applied under their directions. Moreover, scientific men themselves do not seem to be quite sure of the efficacy of even well-made rods, constructed and applied according to the ordinary methods of the best constructors, and the theories of electricity have undergone so many changes during the last quarter of a century that everything except the most direct experiments which can be performed and tested in the laboratory seem to be subject to doubt. As for the lightning rod vendors and agents they have fallen into such evil repute with the house owners of the country that the very name of lightning rod and all that it implies have become a synonym for roguery and deception.

Changing Theories.

The Objections Which Are Usually Urged

against lightning rods are these:

1. *That they are useless.* So many buildings that were furnished with lightning rods have been struck and destroyed that there seems to be very little evidence that a rod does any good.

2. *They are architecturally unsightly.* A house furnished with rods according to the methods in common use a few years ago bristled with points which certainly did not add to its beauty, and the rods themselves were frequently rendered obtrusively offensive by insulators and by their color.

3. *They are sometimes positively dangerous,* from the fact that they may actually invite the discharge and fail to carry it off without damage. That this is true in cases where the rods have been badly designed and constructed is unquestionable.

Objections Not Valid Against Scientific Rodding.

But while these objections are to a certain extent well founded, as against many of the rods which have been put up even within the last 20 years, they are not valid against a properly constructed rod put up according to the instructions of modern science. As regards the first objection we must remember that lightning is not a subject with which we can experiment. In the case of fire, we can at will light an extensive and intense fire, and experiment upon the best methods of extinguishing it, or of preventing its further progress. But we cannot do this in the case of lightning. No man can command "the fires of Heaven," and we are therefore driven to rely wholly upon examination of past occurrences and upon our observation of the effect of such modifications of our contrivances as our knowledge of the mode of action and effects of electricity may lead us to devise, and the determination of the efficiency in these cases is a very difficult problem. Fortunately, however, we have

Difficulty of Experiment.

A Number of Recorded Cases

which afford very complete proof of the efficiency of properly constructed rods. And here let us remark that there is no greater fallacy than that which is embodied in the popular proverb, "lightning never strikes twice in the same place." Such a proverb may have suited the ideas of those ancients who supposed that the "all-dreaded thunderstone" was a bolt sent from the hand of Jove and not subject to the guidance of any natural laws, but to those who believe that the motions of electricity are as certain as those of gravitation; the very opposite of this proverb is true. If lightning strikes a building once it will be very apt to strike it again, for it is evident that the conditions as regards subterranean induction and conduction favor the passage of the current from the clouds to the earth at that point. Consequently we have numerous records of buildings which have been struck again and again and seriously injured before lightning rods were applied to them. The following are a few well attested cases in which lightning rods seem to have afforded complete protection.

Lightning Does Strike Twice.

Buildings Which Have Been Protected.

The Cathedral of St. Peter, in Geneva, although so elevated as to be above all other buildings in the neighborhood, has for three centuries enjoyed perfect immunity from damage by lightning, while the tower of St. Gervaise, although much lower, has been frequently struck. This undoubtedly arises from the fact that all the towers of St. Peter are accidentally furnished with very perfect conductors. The great column of London, known as the monument, erected in 1677, in commemora-

tion of the great fire, although over two hundred feet in height, has never been struck, while much lower buildings in the vicinity have not escaped. The monument, however, is protected by a most perfect conductor, the upper end terminating in a vase from which proceed numerous metal plates designed to imitate the appearance of tongues of flame. The vase communicates by means of stout bars of iron with the metal staircase, which descends through the middle of the column and terminates in the ground. A still more striking instance of the value of lightning rods is a church on the estate of Count Orsini, in Carinthia. This building was placed upon an eminence and had been so often struck by lightning that it was deemed no longer safe to celebrate divine service within its walls. In 1730 a single stroke of lightning destroyed the entire steeple; after it had been rebuilt it was struck on an average four or five times a year, without counting extraordinary storms, during which it was struck from five to ten times in a single day. 1778 the building was reconstructed and furnished with a conductor and during the following five years there was only one occasion on which it was seen to be struck and then the stroke fell upon the metallic point without doing any damage to the building. For two or three years after its erection the church of St. Michael in Charlestown had been frequently damaged by lightning; a conductor was attached to it and during the following fourteen years it had not been injured. The steeple of St. Marks in Venice has a hight of 340 feet and was frequently struck by lightning until a proper lightning rod was applied to it, since which time it has not been injured. These records leave no room for doubt in regard to the great value of lightning rods.

A Striking Instance.

No Room for Doubt.

Disfigurement of Buildings Not Necessary.

The disfigurement of buildings by lightning rods is not by any means a necessary consequence of their application. The chief causes of disfigurement are the points, insulators and metal conductors. Now the sharp points usually seen are entirely unnecessary. A point, in the mechanical sense, is a comparative term. The sharp end of a needle is a point when opposed to the tip of the finger; the point of a 10-penny cut nail may be an eighth of an inch square, and a house itself is but a point when opposed to 10,000 acres of electrically charged cloud. The crestings and finials on an ordinary building furnish points enough, and 50 years ago the writer suggested metal caps for chimneys as being less unsightly and quite as efficient as metal bayonets projecting one or two feet into the air. This form of air terminal is now recommended in the latest work on lightning rods, that, by Sir Oliver Lodge. Insulators are an injury rather than a benefit, and should never be used. The rod should be attached directly to the building, connected electrically with all considerable masses of metal—roofs, gutters, leaders, &c., and it should be painted the color of the house. All authorities agree that, so far as efficiency is concerned, painting a rod has no effect whatever. Sir Oliver Lodge says: "Painting the surface has no electrical effect either way." This fact I emphasized 40 years ago in my book on lightning rods, and against the views generally held by practical men at that time.

Point a Comparative Term.

Painting Does Not Reduce Efficiency.

Intelligent Rodding Affords Protection.

As for the third objection it is based upon errors of construction, but the worst rod cannot be any more dangerous than water or gas pipes or the ordinary gutters and leaders for rain. There needs, therefore, be no hesitation in expressing the opinion that the very great destruction which has been caused by thunderstorms in recent years, especially in country places and in the suburbs of cities, must again call attention to well-made lightning rods and to the security which they afford—not perfect security, perhaps, but one which will diminish the danger from lightning by at least 90 per cent.

Advertisement or "Badvertisement."

The Pleased Purchaser—Following Up Sales—Grievances Just and Unjust—Special Letters and Personal Calls.

There is one man who knows a lot about your business and doesn't charge anything for imparting his knowledge. That fellow is the user of your article.

BY CLARFIELD.

ARE the goods that you sell talking in your favor or against you? One of the brightest sales managers in this country once made the statement printed in italic above. There is a lot of food for reflection in that short remark. The man who is pleased with your merchandise is usually willing to speak well of it. The man who is displeased with it is not only willing but anxious to condemn it.

Do You Follow Up Your Sales?

Do you question your customers to know how their various purchases are meeting their requirements? More important still, do you get after the customer who has failed to come back to your store and find out WHY? If you do this do you employ patience and tactfulness in adjusting the matter to his entire satisfaction?

To some Hardware merchants this may sound like empty talk. If it does sound so it will be for one of two reasons, namely, because the merchant is already following a similar policy, or because he is too independent to entertain such a policy at all.

The Broader Man Succeeds.

The man who is broad enough to realize that he and his business are not infallible; that mistakes in his organization are possible; that flaws in his merchandise may sometimes exist; is far better prepared to grasp opportunity and win success than the man who fails to recognize these possibilities.

Self-confidence is all right in its place. Independence is an admirable quality when judiciously exercised. Still, these two factors have been known to drive business away from a store and make a splendid location a losing investment.

Just grievances should most certainly be recognized, and when the customer does not present them himself, the merchant should make some systematic effort to locate them. Even the unjust complaints should at least be tolerated, and in some instances it will pay the merchant to swallow his pride and make an adjustment which in his heart he knows to be an imposition.

It takes all kinds of people to make a world. The retailer will come in contact with most all of the different varieties at some time during his career. Still he is in business to make money, and, if possible, to do more business this year than he did last. False pride will stand in his way if he doesn't overcome it.

Letters and Personal Calls.

Courteous special letters should be sent to those customers who fail to call as often as they should. And the effort should not end there. One of your representatives who knows the customer should call and find out why his trade is diminishing or has been entirely transferred.

All the effort in the world to get new business will not assure permanent growth unless the regular business is held.

SEWELL B. BOGART, manager of the Hardware department of Brittain & Co., San Francisco, Cal., died suddenly of heart disease in that city last week. He was 39 years old and was a Knight Templar. He leaves a widow and two children.

J. W. CRANCER & Co., Leavenworth, Kan., have moved their Hardware and Housefurnishing business into their new six-story building.

An A. Y. P. Window Display.

Elaborate Display of Ernst Hardware & Plumbing Company—An Appropriate Design.

IN recognition of the Alaska-Yukon-Pacific Exposition which opens June 1 at Seattle, the accompanying window display was designed and installed by S. E. Kerney for the Ernst Hardware & Plumbing Company, Seattle, Wash. The display is an unusually elaborate one combining the effective arrangement of goods with a harmonious and appropriate design and embodying excellent lighting effects. The background, 4 x 13 ft., is covered with dull finished black sateen, and the five spaces into which it is divided are bordered with ⅝-in. gilt moulding.

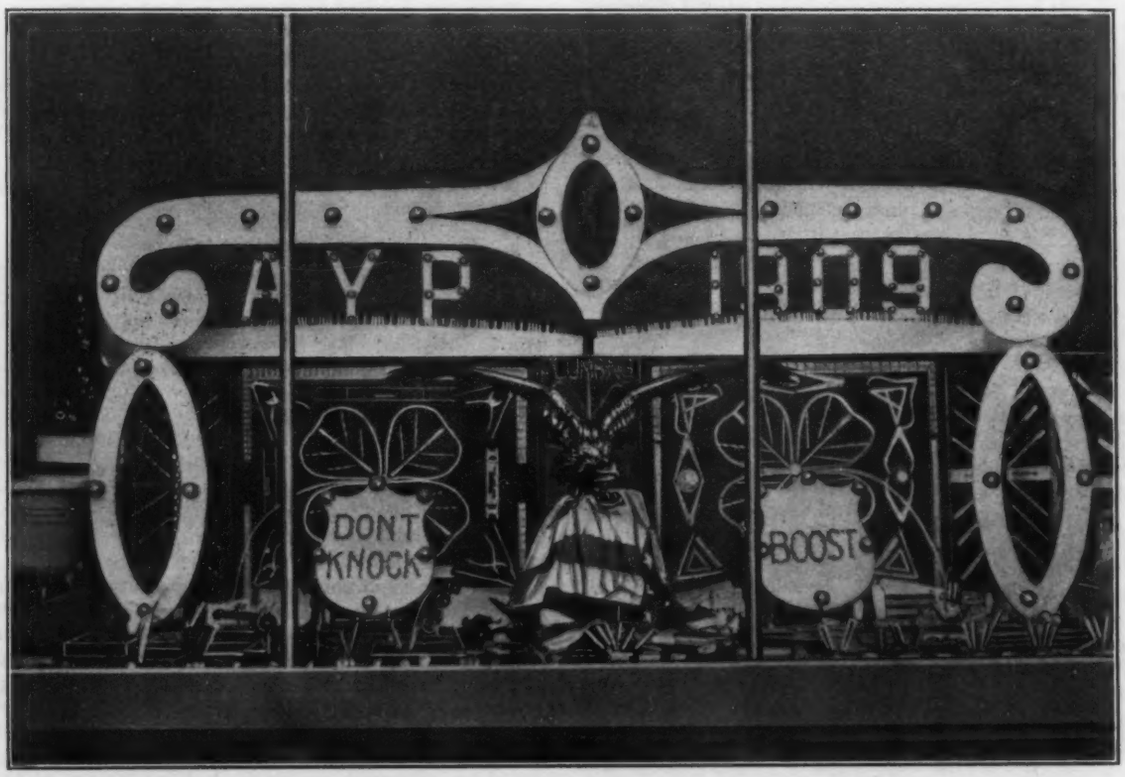
Augers and Bits are systematically arranged in one end space, Coping, Compass and Hack Saws in the center, and Chisels and Plane Bits in the other end space. The two large spaces on either side of the center are used to display Tools of different kinds, all, however, being harmoniously arranged. In each of these large spaces there is a four-leaf clover outlined with Sash Cord, the veins of the leaves being represented by Chisels and Drill Bits.

The word Hardware is outlined with Brass Jack Chain at the top of one end space; at the bottom of the same space is the word Heating. The other small spaces have the words Plumbing, Tinning, Stoves and Paints worked out in the same manner. The background is finished with two Cross Cut Saws set edgeways on the top. The large scroll design, letters, shields, &c., are made of ½-in. lumber covered with heavy white stippling, highlighted and bordered with gilt. The letters are illuminated with 2 candle power frosted Candelabra Base Bulbs, and the balance of the design with 8 candle power Frosted Bulbs.

The letters and figures, "A. Y. P., 1909," hang from the scroll, and are set about 20 in. in front of the background. The shields are in line with the other scroll work, but the tops tip back so that the wording, "Don't Knock" and "Boost," in gilt, may be plainly read. Between the two shields above a draped American flag sits an eagle with wings spread and in a fierce defiant attitude. Just in front of the eagle and resting partly on the flag are the Shovel, Pick and Gold Pan, the A. Y. P. emblems.

The floor is covered with dull finished black sateen like the background, tacked smoothly. A strip about 20 in. wide at the front of the window is also covered with the same material loosely puffed. On this are displayed Pocket Knives, Razors, Shears, &c. Open Pocket Knives are stuck in aluminized cork cones, and set on raised points among the rest of the Cutlery. Distinct price tags are freely used. Between the Cutlery and the background other Tools were arranged in attractive designs, with fences to separate them from other lines at either end.

This elaborate window naturally attracted much attention, bringing immediate results in business, as well as verbal and letter comments. The light provided was better and cost less than the regular lighting in the window.



A. Y. P. Exposition Window Display of Ernst Hardware & Plumbing Company, Seattle, Wash.

THOMAS M. LIVINGSTON, formerly a traveling salesman for the Belknap Hardware & Mfg. Company, has begun business as manufacturers' agent at Ocala, Fla., and will represent several good factories in the States of South Carolina, Georgia and Florida, selling to the jobbing trade.

IWAN BROTHERS, South Bend, Ind., manufacturers of Post Hole Augers and Hardware Specialties, have issued a very handsome calendar, the feature of which is a large reproduction by color photography of a painting of a girl and her saddle horse by the pastel artist, J. Ross Bryson.

F. P. SMITH & Co., Sharon Hill, Pa., are sampling on cards, for display in the merchants' store, Smithicks' Pointed Belt Hooks in steel, for use with Hammer and Awl or Punch, in 20 sizes, for fastening Leather, Rubber, Canvas or Duck Belting, adaptable to Wood and Metal Pulleys. They are sold in solid lines or three ever-ready assortments.

THE MASSEY VISE COMPANY, Chicago, Ill., formerly at 176-178 South Clinton street, has removed to its new plant, office and works, 208-210 Michigan street, where with increased lines of Vises for bench, planer and milling work, the company is prepared to promptly execute all orders.

MISSISSIPPI RETAIL HARDWARE ASSOCIATION.

A telegraphic report of the first day's sessions of the annual convention of the Mississippi Retail Hardware Association, held on the 11th and 12th inst., was given in our last issue. The convention was a businesslike gathering, with a programme neatly but not ostentatiously printed, which was carried out to the letter, except that the work of the association was so well handled that it was possible to dispense with the Wednesday afternoon session.

The court house, in which the meetings were held, was an almost ideal place for such a gathering, being of sufficient size, admirably arranged for comfort and entirely removed from the noises of the streets or other disturbances.

Strength of the Association.

As was shown in the secretary's report, the last year was one of very satisfactory growth, and the organization is much stronger than ever before. Besides this numerical strength, there are in it a number of broad-minded and successful merchants, whose caliber and ability will compare well with any of their compeers in other States. There seems to be, too, a thoroughly loyal spirit, which counts for much in securing efficiency in the practical working of the association.

Visitors and Guests.

There were present an unusual number of representatives of other Hardware associations. Among these may be mentioned: M. L. Corey, representing the Indiana and the National associations; W. P. Lewis, secretary of the Pennsylvania Association, and of the National and Pennsylvania Hardware Mutual Insurance Companies; C. A. Peck of the Wisconsin Insurance Company and secretary of the association of that State; E. E. Mitchell of the Arkansas Association, and R. R. Williams, Hardware editor of *The Iron Age*, who came as a delegate from the New York Association, of which he is an active member. There was also a pleasant surprise for the convention, and many old friends of the association movement in the attendance of C. C. Fouts, who was long active in the Ohio Association. All of these gentlemen took part freely in the exercises and contributed much to the interest and success of the gathering.

Jobbing interests were also represented, there being delegations from the great St. Louis jobbing houses, the Norvell-Shapleigh Hardware Company and Simmons Hardware Company, while Memphis was represented by R. D. Warren of the Benedict, Warren & Davidson Company. The addresses of W. D. Simmons, R. W. Shapleigh and Mr. Warren on the second day were especially notable.

The Officers.

D. H. Hale, Aberdeen, who presided during the convention, made an excellent record, and his administration was highly complimented. Some matters in the field of legislation, which called for association action, he was able to manage personally, and thus unobtrusively accomplish the desired good. His successor, Mallory Davis, is an able and successful merchant who was brought into very favorable prominence at last year's convention by his striking and practical paper on the management of freights. The association is fortunate in having such a leader to carry on the good work so well begun.

An implied compliment was paid to the secretary, John E. Sommers, by making the term three years instead of one, notwithstanding the fact that this action was taken before his election, but it was a foregone conclusion he would be the nominee in view of his fine work, his popularity and the esteem in which he is held.

The new board of officers is as follows:

PRESIDENT, Mallory Davis, Itta Bena.
FIRST VICE-PRESIDENT, Henderson Baird, Greenwood.
SECOND VICE-PRESIDENT, A. P. Orrick, Canton.
SECRETARY-TREASURER, John E. Sommers, Clarksdale.
EXECUTIVE COMMITTEE: E. S. Crane, Yazoo City, and E. G. Peatross, Jackson

It will thus be seen that those on whom the chief responsibility rests have excellent associates to aid them in their work.

Manufacturers Present.

There was no attempt to have anything in the way of an exhibition of manufacturers' products, but many were present, either personally or by their traveling salesmen, among whom were the American Steel & Wire Company, Pittsburgh Steel Company, E. C. Atkins & Co., Capewell Horsenail Company, John Deere Plow Company, and others.

Mutual Insurance Interests.

Mutual Hardware insurance was prominently discussed before the convention, being fully and forcibly presented by W. P. Lewis, C. A. Peck and E. E. Mitchell. The association took formal action, commending this form of insurance to the membership, and measures were adopted to make it a means of bringing new members into the association.

Topics of Discussion.

Some consideration was given to the annoyance suffered by the merchants of the State on account of the competition of the peddlers and to the measures which might be taken to correct existing conditions.

Parcel post did not receive extended attention, but the importance of the matter was recognized and the association was urged to be active in cultivating a correct public sentiment, holding itself in readiness to take aggressive action when the matter again comes up at Washington.

There is evidently much need of a better lien law in Mississippi, as at present merchants supplying material or furnishings for buildings have practically no protection.

Broad and reasonable views in regard to freight matters prevailed among the merchants. There is no disposition to enact legislation hostile to the railroads and it is recognized as wise policy to give them an opportunity to secure a good return on their investment, so they may be enabled to give good service to the public. There is, therefore, objection to the general establishment by law of a 2-cent passenger rate, a resolution to this effect being unanimously adopted at the Wednesday morning session, but at the same time a call for lower and better freight service. In this connection the crating of stoves was referred to and its relations to the interests of the merchants.

The importance of cultivating the best relations with the farmers was emphasized and a pleasant feature was the presence at the convention of a representative of the Farmers' Union, who made a brief address.

Some discussion was given to the question as to the practice of exchanging goods between merchants of the same town and the terms on which such transaction should be based.

Columbus for 1910.

There was a good deal of friendly rivalry in regard to the next place of meeting. Several invitations were extended, but the matter closed by the unanimous decision to meet at Columbus, with the prospect that the following

year it may be advisable to go to the southern part of the State.

Association Relations.

The association has very pleasant relations with traveling salesmen and with jobbers and manufacturers. It succeeds in identifying with its work many belonging to these other branches of the trade and in securing the active efforts of the traveling salesmen in extending membership. The question as to the desirability of incorporating the association was discussed at some length. It was decided advisable to do so and steps were taken accordingly in this direction.

Hospitality.

Jackson is an important convention city and so many organizations hold their annual gatherings there that it is impossible to extend to all of them anything like an official or general welcome, which might be given in smaller and less popular convention towns. For this reason no special expectations were entertained in regard to the hospitality which would be afforded, but all who attended the gathering were impressed with the generous and considerate welcome extended the association. The Hardware merchants of the city were constant in their attentions and their stores were visited by most of the merchants. Notable window displays were conspicuous and suggestive of good methods in this important field.

A number of ladies were in attendance and their comfort and pleasure was looked after by the Executive Committee and the ladies of the city. A reception and ball on Tuesday evening was a brilliant affair. The manner in which the business houses in Hardware and related lines united in extending these attentions was very much appreciated, and the visitors and members of the association carried away the most pleasant impressions of Jackson as a business center and of its people in view of their cordiality and courtesy.

MALLORY DAVIS.

D. H. HALE.

A. P. ORRICK.

J. E. SOMMERS.

PRESIDENT'S ADDRESS.

The presidential address of D. H. Hale, Aberdeen, was an able and interesting review of association work. It was substantially as follows:

Reviewing the experiences of the past year is not an especially pleasant task. It is useless to try to explain the cause of the financial depression, many things conspiring to bring it about; but I think you will agree with me that the worst is over. And while we have suffered in a financial and business way, yet the experience and hard rubs which we have had are not without profit to each and every one of us.

Association Has Prospered.

Notwithstanding the business depression since we last met together, our association has prospered, our membership has increased; a much better interest has been shown, with more promptness and willingness to assist your officers. So, taking it altogether, the rough usage we have had to stand has at least served a good purpose, the cementing of friendship and greater loyalty to our common cause.

Need of Organization.

If I properly understand the exact meaning of this organization, it is for the promotion of a kinder feeling among the retail Hardware merchants, to promulgate certain principles for our mutual good. We learn each year, by experience, how to improve our condition; we get new business ideas; we come in contact with the most successful business men, not only of our State, but other States. Never was there a time when such an association is needed more than now. Never before did the Hardware merchants join hands with such friendly, social greetings as now.

Measure of Success Depends on the Members.

Many questions must be handled through this association. The success and inspiration of this association depends largely upon the attendance of its members. Individually we probably could not handle the perplexing questions, but collectively we are a power, and the power must only be used for good. Our meeting together has done much to correct trade evils and promote good, sound business methods. We feel that we have much to pride ourselves on and to be thankful for. While our membership is not as large as we had hoped and worked for, yet we feel that we have accomplished great good.

In reviewing our past year's work I want to say first, doubtless our association has not had the publicity that other associations have enjoyed, yet I assure you that notwithstanding this your association has been alert and one of the leaders in everything in which our interest and the interest of the State was concerned.

Freight Rates.

Referring to the rate question of last fall, your association, through its officers and committees, took this question up directly with the railroad officials, and we had positive assurance from these officials long before any one else that this rate would not be put into effect as a whole.

I merely mention this fact to you as doubtless many of you did not know just what steps were being taken by your association. I don't want you to understand me to say that we were the only ones in this rate fight; we were joined by the Mississippi travelers in this, and I assure you that they did their part also. We have paved the way for that friendly co-operation among business rivals that is so necessary to success, the principle of live and let live.

Keep on Smiling.

The future of this association is assured. Success in all of our undertakings is plainly written. Now I ask you to keep on smiling. Associations are the order of the hour. You are going to have a great time here, and you will return home with new energy, faith in the future and thankful that you belong to a most excellent association that is productive of good fellowship and mutual understanding.

Legislative Committee Recommended.

I call your attention to the fact that this association should appoint a Legislative Committee, whose duty should be to have repealed such laws as are detrimental to the interest of the retail Hardware trade, and to have enacted such laws as will best promote the interest of our association and State. It does seem to me that as a whole the Hardware merchant has more taxes, especially privilege taxes, to pay than any other merchants.

Protection Against Peddlers.

We should further interest ourselves if possible to try and remedy in some way our present law regarding the peddling of goods, such as are carried by the regular Hardware merchant. Each of us will admit that we should have some protection. How shall we get it—by sitting still? No; let us go to work. The merchant is nothing unless he is a good citizen.

Public Spirit.

To be a good citizen he must take an active part and interest in whatever is for the good and the advancement of his State, county and town. He must use his influence to see that men of good sound business ability are sent to our legislative bodies, for they make the laws that either make or undo our county. In the past years we have had much legislation that has been detrimental to every interest in the State.

Longer Term for Secretary.

I further ask you to consider such changes as may be suggested by any member of this association for the good of the same. It seems to me that our secretary-treasurer's term of office should be changed from one year to two, three or four years. The secretary-treasurer is our most important official, and to insure him a longer term than one year, in my opinion, will make his work more interesting and instructive.

SECRETARY SOMMERS' ANNUAL REPORT.

The annual report of the efficient secretary of the association, J. E. Sommers, Clarksdale, who was re-elected for a three-year term, was in part as follows:

At the close of the first year our membership was 70 active and 42 honorary. Since then 14 have been added to the active list; of the honorary I cannot report; such members join or fail to join at the meetings.

The total number of hardware dealers in Mississippi is about 200 and, while we cannot hope to have such a numerous membership as a great many of the other State associations, this thought should not lessen our desire to make continued endeavors to bring all of our dealers into the fold of the association, in which, if we succeed, no State, however large its membership, can excel.

Opposition to Increased Freight Rates.

When, in August last, the increase in railway freight rates was proposed, I, with the advice and consent of our honored president, wrote to all the dealers in the State proposing that we raise funds to be used in opposition thereto; the president subsequently called a meeting of the executive committee to be held in Jackson. They met and called for a contribution of $5 from each dealer, to be used for the purpose of the Mississippi Freight Protective Association, same to be returned to contributers if not used. Fourteen responded with $5 each and one with $3. None was used for the purpose intended, so the same was credited to each contributor on his dues for 1909-10.

Parcel Post.

Among many helpful documents sent me by our efficient national secretary were a number on the subject of parcel post, in opposition to which he has done yeoman service. Stimulated by his example, I tried to excite to action our own dealers. I sent to each a form of petition for signatures and transmission each to his representative in Congress. I also wrote officially to our Mississippi Senators and Representatives urging efficient action against such enactment and received replies from some of them, not all absolutely favorable.

Mutual Insurance.

Several of the communications received from State secretaries contained much concerning Hardware mutual insurance. It seems to me that the number of our membership, even though it grow to include all the Hardware dealers in the State, does not afford a sufficiently broad basis for a separate insurance organization in our own State, so that while the plan is good and the protection equal, at least, to that offered by other companies, as well as being less costly, it would be well, at least, for the present, for each of us to insure with one or other of the State insurance associations.

THE manufacture of Chain at the Reformatory, Jeffersonville, Ind., is to be discontinued and the contract set aside. Chain manufacturers have continually protested against it and at one time brought injunction proceedings to stop it on the ground that it was a violation of State law to dispose of prison made goods under a contract. The suit, however, was dismissed. It is announced that the present step is taken to forward the perfection of the trades school system at the institution. Already 75 of the 150 employees of the Chain works have been transferred to the various trade schools and the rest will be transferred before long.

IT has just been decided to hold the annual meeting of the Retail Hardware Association of South Carolina at Charleston on July 5, 6 and 7. Paul W. McLure, Greenwood, is secretary-treasurer of the association.

Handling Screen Doors.

Clever Ideas of Weaver, Palmer & Richmond, Rochester, N. Y.

TWO or three excellent ideas applied to the handling of Screen Doors may be observed in the store of Weaver, Palmer & Richmond, Rochester, N. Y. This enterprising house now occupies a substantial and commodious building which has been elaborately fitted up, and with its handsome fixtures and complete equipment of shelving, sample boards, &c., is a fine example of a modern Hardware establishment.

The attention is atracted by the contrivance for showing sample Doors, illustrated in Fig. 1. It is one of those

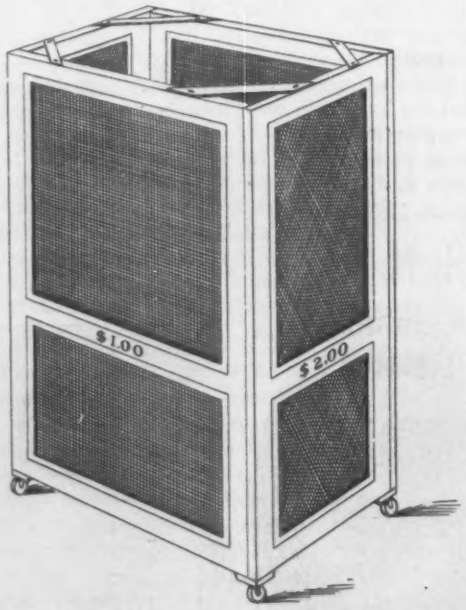


Fig. 1.—Device for Showing Sample Screen Doors.

schemes which is so simple and convenient that one wonders why it has not been found in use in many places. Four different designs or grades of Doors can be shown as indicated, fastened together in an upright position and forming the four sides of a square. The resulting piece of furniture was put on casters so that it could be easily kicked around, and standing either inside or outside the store afforded buyers an opportunity to see at a glance four different styles of Doors with the price marked on each and decide what they wanted in a few moments. Furthermore, this arrangement can be used to show different kinds of Screen Door Hardware—Hinges, Springs,

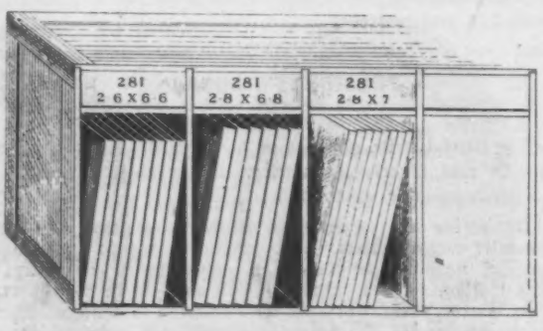


Fig. 2.—Rack for Storing Broken Crates of Screen Doors.

Pulls, &c.—which may be attached to the doors as in actual use.

The method used by the firm for keeping open stock—that is, broken crates of Doors—is shown in Fig. 2. A rack is built of rough lumber, as indicated, the different compartments holding about six thick Doors and eight thin ones. The Doors are run in on their side edge so that they lie end out, and the sizes are shown by marking on the strip above the different compartments.

ALABAMA RETAIL HARDWARE ASSOCIATION.

The third annual convention of the Alabama Retail Hardware Association met in Birmingham on Wednesday, May 12, in the banquet hall of the Hillman Hotel, where the headquarters of the association were established. About 200 persons, representing the different classes of the trade, were present.

The meeting was called to order by J. W. Beasley, the president, who referred to the difficulties which had presented themselves and which had been overcome by the officers of the association in connection with the work of the organization and the arrangements for the convention.

After singing "America," prayer was offered by the Rev. J. W. Staggs, D.D., and Mayor Frank P. O'Brien, an old Hardwareman, made an appropriate address of welcome to the merchants and tendered the keys of the city to the association. A felicitous response was made by J. U. Cureton, Dothan, who was appointed to this duty in the absence of M. T. Braswell.

Messages of greeting were read from Frank A. Bare, secretary of the Ohio Hardware Association; A. T. Stebbins, president of the National Retail Hardware Association; the Belknap Hardware & Mfg. Company, Louisville; the William J. Oliver Mfg. Company, Knoxville, and the Southern Co-Operative Foundry Company, Rome, Ga. Several members sent telegrams of regret that they were for different reasons prevented from attending the meetings of the association.

Appointment of Committees.

The following committees were appointed by the president:

RESOLUTIONS.—Rane McMillen, J. H. Jackson and J. W. Baker.

NOMINATIONS.—W. M. Ross, J. D. Hanby, S. B. Bennett, F. M. Kelley, E. A. Hammitt.

CONSTITUTION AND BY-LAWS.—M. Dowling, W. B. Howard, George Bowen.

AUDITING.—J. R. Gamble, H. W. Dunne, Ed Warren.

Addresses at the Opening Session.

An able paper was presented by J. R. Gamble, Wetumpka, having as its subject, "What Kind of Advertising Is the Most Effective for the Country Dealer?" At the conclusion of the paper there were many expressions of appreciation of its value. It is given in full in the following columns.

On the subject, "Can a Cash Hardware Store Be Made a Success?" practically all the merchants present had something to say of interest, and valuable suggestions were brought out.

The question, "How Many Times a Year Should Our Stocks Be Turned?" lead to the conclusion they should be turned at least three times a year to show a satisfactory profit.

Harry Jones, pioneer salesman of the Moore-Handley Hardware Company, Birmingham, extended formal invitations to the members to use the privileges of the Southern Club.

An interesting and able address was made by J. D. Moore of the Moore-Handley Hardware Company, showing the advantages of co-operation rather than rivalry.

W. C. Pollard of the Gray & Dudley Hardware Company, Nashville, Tenn., spoke on "Salesmen and Their Relations to the Hardware Merchants."

Other brief addresses were made by Mr. Thomas of the American Steel & Wire Company, Harry Jones and others.

J. M. CURETON.

J. W. BEASLEY.

The Wednesday afternoon session was taken up with a general discussion of topics of interest to the trade at large, and was a very successful conference in view of the fact that the members so generally expressed their opinions and gave the results of their experience.

Thursday Morning Session.

After a brief executive session, in which R. R. Williams was introduced as delegate from the New York association, of which he is an active member, the meeting was thrown open to all and a large number of merchants, manufacturers and traveling salesmen as well as other visitors from a distance listened to or took part

J. R. GAMBLE.

L. G. SMITH.

MARVIN DOWLING.

in the deliberations. Addresses from the following gentlemen, well known to the Hardware trade, were given at this session: W. D. Simmons, president of the Simmons Hardware Company, St. Louis; R. W. Shapleigh of the Norvell-Shapleigh Hardware Company, St. Louis; W. P. Lewis, secretary of the Pennsylvania Retail Hardware Association, and also of the Pennsylvania and National Hardware Mutual Insurance companies, Huntingdon, Pa.; C. A. Peck, secretary of the Wisconsin Retail Hardware Association and the Wisconsin Mutual Fire Insurance Company, Berlin, Wis. These addresses abounded in valuable suggestions and the subject of mutual insurance especially was thoroughly and ably considered.

Official Reports.

At the Thursday afternoon session President Beasley made his annual address, which is given elsewhere. The report of Secretary-Treasurer Smith was also presented, showing the association to have gained many members during the past year and to be in splendid financial condition.

Amendments to the Constitution.

The report of the Committee on Constitution and By-Laws recommended that the by-laws be amended so that traveling Hardware salesmen, or salesmen of kindred lines, may become associate members by the payment of $1 dues.

Another recommendation was that the total number of the Executive Committee be increased to 11.

It was also deemed advisable that the treasurer be required to provide the association with an indemnity bond in a reputable bonding company, to be determined by the Executive Committee, the premium on such bond being paid from the funds of the association.

Other recommendations were that there be appointed a committee of three on complaints and grievances, such committee to be named by the president from the members of the Executive Committee, one of them being the first vice-president of the association and chairman of the committee, and also that a Legislative Committee of three be nominated to look after all proposed State legislation.

A Social Smoker.

Instead of having a banquet, reception or smoker of the ordinary type, the association held what may be termed a social smoker on Thursday evening. It was held in the banquet hall, the regular meeting place of the association, a fine and attractive room. There was no formal programme, but under the direction of Harry Jones, who was asked to serve as toastmaster, a delightful and very profitable evening was spent. Light refreshments were served. The gathering was described by the master of ceremonies as a family company, in which every one was expected to have a word, all being free to say anything they pleased. All were, however, expected to respond to the call of the leader, while at the same time ample opportunity was given to any to speak voluntarily.

Among those who talked were C. A. Peck, secretary of the Wisconsin Association; M. L. Corey, secretary of the National Association; W. P. Lewis, secretary of the Pennsylvania Association; J. D. Moore, president of Moore-Handley Hardware Company; R. R. Williams, Hardware editor of *The Iron Age;* R. W. Shapleigh, vice-president of Norvell-Shapleigh Hardware Company; H. W. Owsley, sales manager Norvell-Shapleigh Hardware Company; J. M. Thomas, sales manager of the American Steel & Wire Company; W. D. Simmons, president of Simmons Hardware Company; J. U. Cureton, Dothan; M. Dowling, Ozark; N. T. Braswell, Demopolis; John D. Wyker, Decatur, and James Shannon of Blocton.

There was naturally great diversity in what was said, and the elements of humor, practical suggestion, pathos, loyalty to the association, patriotism, and notably the spirit of fraternity and good fellowship had appropriate recognition.

There was not an unpleasant or discordant note. Much of the success of the evening is to be credited to Toastmaster Jones, who was exceedingly happy in his direction, while his popularity, attractive personality and cheery way contributed much. The meeting may well be taken as a suggestion to other associations and a model after which they may pattern. There was a unanimous expression that such a gathering and interchange of thought and sentiment was better than a banquet or an ordinary smoker with entertainment by outside talent.

Usefulness of the Association.

Friday morning's session was taken up by general discussion of subjects of interest to the trade, one of the most important being the question, "How Can the Association Be Made More Beneficial to Its Members?" The insurance feature was again emphasized by Messrs. Peck and Lewis. A number of practical suggestions in regard to association work and efficiency were made by several of the members. John D. Wyker, Decatur, urged the members in different parts of the State to form district associations, whereby much good could be accomplished.

The Buying and Selling Departments.

The comparative importance of the buying and selling departments of the business were debated in a practical and interesting vein at the Friday morning session. The supreme importance of both of these parts of the business was thus enforced. While it was conceded that the importance of salesmanship can hardly be overestimated, the discussion rested more on the buying department and the importance of having the right goods in stock at the right time. Some attention was given to the question as to what should be done when goods are called for which are not carried.

Efficient Management of the Convention.

Among the things which contributed to make the convention eminently successful was the excellent management of it by the officers in charge. The president and secretary were highly complimented for the energy, skill, promptness and courtesy with which their duties were performed. The arrangements for the meeting were admirably carried out, and the new administration enters upon its work under very favorable auspices.

New Officers.

The following officials recommended by the Nominating Committee, W. M. Ross, chairman, were duly elected:

PRESIDENT, J. U. Cureton, Dothan.
FIRST VICE-PRESIDENT, J. R. Gamble, Wetumpka.
SECOND VICE-PRESIDENT, F. M. Kelley, Selma.
EXECUTIVE COMMITTEE: J. W. Worthy, Alexander City; W. M. Ross, Albertville; James M. Simms, Georgiana; N. T. Braswell, Demopolis; M. Dowling, Ozark; E. A. Hammick, Sylacauga; T. H. Good, Florence.
GRIEVANCE COMMITTEE: Rane McMillen, Demopolis; R. L. Collins, Florala; O. W. Sibert, Gadsden.
LEGISLATIVE COMMITTEE: John D. Wyker, Decatur; George R. Byrum, Ensley; D. H. Mathews, Camden.
DELEGATES TO NATIONAL CONVENTIONS: 1909, J. W. Beasley, Birmingham; 1910, J. U. Cureton, Dothan.

Most of the persons on whom rests the responsibility of directing the affairs of the association have had experience in it and were chosen for their earnest interest and their fitness for the positions given them. The new president has been active in the association and made his impression on the membership as a merchant of ability, under whose leadership it is expected that there will be a further marked increase in the strength and usefulness of the organization.

At a meeting of the Executive Committee, held immediately after the adjournment of the convention, L. G. Smith, Ensley, the popular and efficient secretary-treasurer, was again elected to the office.

Co-operation of the Traveling Salesmen.

The friendliest feeling evidently prevails between the members of the traveling force of the manufacturers and jobbers and the merchants whom they visit. Their admission to honorary membership will undoubtedly tend to ally them even more closely to the association. In view of their constant contact with the trade it was decided by the Executive Committee to offer three prizes to the salesmen who shall enroll the largest number of active members before the next convention.

Birmingham in 1910.

Very cordial invitations for the next convention were extended by several cities, any one of which would be

eminently suitable. It was, however, decided to accept the invitation of Birmingham. The 1909 convention was so notably successful it was decided best to meet in the same city next year, when there is no doubt that a similar cordial welcome will be extended.

Resolutions.

The report of the Committee on Resolutions, which was unanimously adopted, was in part as follows:

The Alabama Retail Hardware Association is indebted to and does hereby acknowledge the courtesies extended to it by the honorable Mayor who so kindly welcomed us to the city of Birmingham.

We feel under lasting obligations to the wholesale dealers and manufacturers of this great city for attentions shown us, which have materially added to the pleasure and success of this meeting.

We desire also to express our sincere appreciation to Mine Hosts C. H. Nabb and Manager Bailey for the use of the hall and for courtesies otherwise extended.

We want also to acknowledge the pleasure and profit derived from the presence at this meeting of Mr. Corey, our National secretary; Mr. Williams of *The Iron Age*, and other gentlemen prominent in the Hardware trade.

We are especially grateful to Messrs. Peck and Lewis, who have so ably presented to us the advantages of mutual insurance, and would recommend to our members the desirability of placing at least a portion of their insurance with them.

To the chairman of the entertainment committee and our worthy toastmaster of Thursday evening, Harry Jones, and his associates, we extend our heartfelt thanks and best wishes. Their unfailing attentions have added much to the pleasure of each one in attendance.

We again express our opposition to any form of parcel post legislation, believing, in effect, it would retard and injure the progress and prosperity of the whole country.

Last, but by no means least in the category of our obligations, we feel we cannot speak too highly of the very efficient services rendered the association by our president, Mr. Beasley, and our secretary-treasurer, Mr. Smith, who has borne the heat and burden of the day and who has worked in season and out of season to promote the welfare of the association.

PRESIDENT BEASLEY'S ADDRESS.

The presidential address of J. W. Beasley, Birmingham, was able and stimulating and was listened to with appreciation and attention. After making some reference to association conditions during the two years of its existence and commending the faithful, efficient and enthusiastic service of Secretary Smith, as well as the influence of the traveling salesmen in bringing the association to the notice of merchants throughout the State, Mr. Beasley spoke as follows:

Capital is organized, labor is organized, manufacturers are organized, jobbers are organized, and the retail man who thinks he can singly and alone combat all these organized forces should properly be classed with the Texas bull that tried to butt a train off the track.

I cannot at this time undertake to enumerate the many advantages in organizing our forces, and must mention only a few of them, and in a general way. It is not the purpose of our organization to control or attempt to regulate prices, except in so far as by cultivating a more kindly and fraternal spirit with our competitors, and coming to realize thereby that they are not such bad fellows after all destroys that jealous, envious spirit, and stops the unscrupulous and suicidal cutting of prices, and allows every dealer to get his regular price.

A Broad Knowledge Required.

The hardware man, certainly more than other mercantile classes, is required to know both theoretically and practically more minute details; he must understand every detail of every one of the varied branches of the hardware business, and not only know them for his own protection and profit, but must be able to give advice as to what kind of plow gives better results in a given soil, what brand and color of paint will look better and last longer on a home, just what specifications are required to construct and maintain the most satisfactory and permanent road through his county, advise as to the kind of roof to put on the church, the best system of heating the school building, and so on infinitum. It is, therefore, imperative that he inform himself on all these subjects by utilizing all the resources at his command.

Co-operation with Competitors,

as it shall be brought about by association and the interchange of ideas at the State convention, contributes more largely to this education than any and all other forces combined.

We have many a genius in the hardware line, but we have not a single man who can of his own volition become expert in all the many branches of the great hardware trade. One man specializes on one thing, one on another, a third on another, and by coming together in annual convention, and each man giving the others the benefit of his experience, and knowledge of his specialty results in a general education which is bound to prove greatly profitable to all in attendance.

Our interests in the main are the same, our purposes are one, and if we are to accomplish our purposes we must unite ourselves in such a way as to be advised of our own needs and those of our neighbors, and stand shoulder to shoulder and pull, not as a number of individuals, but as one man, for our rights. Then and not until then will our hardware people receive the recognition to which they are entitled.

Through the individual co-operation of our own members, and the combined influence of our sister associations under the National Association, nothing under the shining sun can prevent our getting any reasonable demands granted.

What Might Be Accomplished.

If every hardware dealer in the country was to unite with the existing association in his State, attend the meetings thereof, and use every means in his power to advance the interests of his association, some of the results would be a death blow to parcel post; encouragement of deep water ways; 14 feet of gulf; good roads in every State, with considerably increased trade; no more demoralizing price cutting; equitable express and freight rates to all points; better kept stores; improved methods of advertising; advanced systems of conducting business; more dealers doing business on a cash basis; the trade of catalogue houses largely restricted, if not entirely destroyed; a better feeling between dealers, fewer jealousies and more genial business relations all around.

Local or District Associations.

I very strongly recommend and would urge the organizing of local or district associations. There are always local conditions obtaining and local problems arising over which dealers beyond the district have positively no control, and must be met by the dealers directly affected. Get together, brethren, discuss the local problems; you will arrive at a satisfactory solution of them, which will not only result in a pleasant, friendly relation between competitors, but will show profitable results in such tangible form as can be counted in the cash drawer.

Back Up the Secretary.

I further recommend and insist that when your secretary or the national secretary sounds a note of warning, and asks you to perform some service, or write letters to your United States senators and representatives in Congress, presenting the cause of the hardware man, that you do not pass it by lightly, thinking your letter will have no weight, but let every man of us do as he requests, and, though your representatives may not at first agree with the sentiment expressed in these letters, as they continue to come, first by the dozen, then by the hundreds, from every section of his State, each clothed in different words, though all bearing on the one main point at issue, I imagine one can see them wince under the cross fire, and when the final issue comes they will be forced to vote the expressed will of their constituents.

Combatting Parcel Post.

Perhaps but few of the members of your young association know that in all probability had it not been for the thorough organization of the hardware men of the States, through the leadership of our national secretary, the great catalog houses would probably to-day have been delivering practically all the profitable goods (the small wares) to your neighbors through parcel post, leaving you nothing to sell except the staple articles, on which they cannot compete with you. But, thanks to this wise and energetic leader, through whose efforts more than any and all agencies we are yet spared this unjust legislation. Let us hope that by strengthening our forces and standing loyally by this capable and faithful general that we shall be able to deal such a deadly blow to the parcel post bill that it will never be attempted again.

Officers Cannot Do It All.

Hardware associations are entirely co-operative, and if its members are to profit much by organization each must be willing to do his share of the work which is to result in profit to himself and every other member. Your president and secretary constitute the official heads of the association, and will do all in their power and will give much of their time in the interest of the association, but if our members are going to take a back seat, and expect the officers to do all that needs to be done, you must not expect the association to prove very profitable.

Experiments During the Year.

Let me suggest that you take notes of the proceedings of this convention, take the ideas home with you, and put the good ones into practical use, note the result and come back to the convention next year, and give us the benefit of

your experiments, point out to us all the strong and weak points, so as one of us learns, all of us will learn. If you do nothing more or nothing better to-day than you did yesterday, wherein lies your progress. Just as truly as the calendar rotations bring the changing seasons, just so truly will the changing seasons bring changed conditions, and these changed conditions require an accurate knowledge of cause and effect in order to satisfactorily meet the demands of the new conditions.

In no place and under no conditions can a hardware man become as conversant with the new and improved methods of meeting these demands as in the annual convention.

Trade Journal Help.

I further recommend that you all will not only subscribe to, but carefully read and digest, a good selection of the trade journals. These journals keep us advised of the new things constantly being invented and placed on the market; and I am sure most of us have learned that the new article is doubly profitable, in that it brands the dealer as wide awake and progressive, besides new articles always bear a better per cent. of profit. Most of our journals conduct a query page and invite all subscribers to go to them with their perplexing problems, and they are almost invariably solved to the satisfaction and profit of those seeking information. They keep us informed as to the doings of other associations and lend encouragement and enthusiasm and new ideas which we all so much need.

Learning from the Panic.

I fear that many of us have learned to offer the so-called panic as an excuse for not doing more business on the right side of the ledger. Let us no longer plead panic, but rise in our might and allow our problems to develop us. Let us take advantage of the existence of a panic to learn economy and put it into rigid practice. Let us learn to make a success of our business despite panic. A poor business can make money in good times, but it takes a good man to make money during panicky and uncertain times.

Be honest in your dealings with your fellow man; approve of honesty in others, and force them by your example to be honest with you. Let it become the recognized fact in your communities that the hardware men stand for all that is good and best in life, and then the hardware organization of the country, composed of such units, will become the strength and support of the State.

THE EDUCATIONAL MISSION OF THE HARDWARE MERCHANT.

At the closing session of the convention a suggestive and able paper was read by Marvin Dowling of Byrd & Dowling, Ozark, Ala. It was entitled "The Educational Mission of the Hardware Merchant." After referring to the importance of education in all fields, Mr. Dowling pointed out the need which exists for merchants to educate the community in regard to the goods which are connected with social progress and well being, and the opportunity there is to extend trade, as the people are thus educated along the lines of agricultural and industrial activity, and are able to enjoy more of the comforts which are characteristic of advancing social conditions. Mr. Dowling said:

The field which awaits our development is along industrial lines, for when considered broadly the hardware man furnishes the equipment for industrial workers everywhere. To bring to the attention of those around us the means by which and with which the great masses toil, that they may be fed and clothed and educated and uplifted, appears to be peculiarly within the scope of the hardware merchant's activities. When it is declared that

The Hardware Trade Offers a Vast Field for Usefulness,

think not that empty or vainworthy terms are employed. Evidences are not wanting that conscientious workers in the field have accomplished much. But rich as may have been the achievements of the past, the future is laden with still greater opportunities. Only recently have the modern and improved lines of agricultural implements obtained anything like a satisfactory foothold in many portions of our State.

It is virtually a matter of yesterday that steel wire fencing came to be a staple article in the hardware stores of Alabama. We do not hesitate to say that the signs of the times are unmistakable that many of us have been and are at work educating, if that expression is liked, or, if it shall be preferred to use a commercial term, we might say advertising.

Betterment of Farming Conditions.

Time and again it has been declared that the future of our country depends upon our agricultural prosperity. If

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this be true no good citizen can afford to hold aloof from anything which will tend to a betterment of farming conditions. Coming in daily touch with these people by furnishing the tools and implements whereby their crops are cultivated our opportunity is great for suggestion and help.

Generally speaking, when a new tool or implement is put upon the market it is placed in the hands of the hardware merchant. To the educating abilities and influence of the hardware merchant in distributing these goods is largely committed future agricultural prosperity or adversity.

Raising Home Supplies.

Without presuming to be an educated farmer, for many years I have attempted to closely observe agricultural operations. To make an application to ourselves, it would appear that no greater problem needs solving in our midst than that of raising home supplies. To a large extent the section from which I have both the pleasure and honor to come pleads not guilty to this charge. I am glad to tell you that our county raises more beef and pork than it can consume, but I must be honest enough to confess that we run a little short of foodstuffs every now and then.

And while raising more hogs and cattle than we consume we advocate the growing of them in quantities to sell as a money crop. In this direction we think we are able to see some progress, but at best this class of operation in our midst is on a modest scale. The advocacy of more hogs and cattle necessarily calls for an increased output of fencing, and in this direction it cannot fail to be an inviting field for the progressive hardware merchant. Take it as you will, but we make bold to assert that

Our Agricultural Future Depends Largely Upon Whether or Not We Shall Raise Animal Crops

of some description, including poultry. And why? We need but to turn to the pages of sacred history to be informed that "cattle upon a thousand hills" was anciently use as a synonym of wealth. And what was true then is true to-day. We need not cavil at the proposition that our ancient fathers were a pastoral people, having almost unlimited areas for grazing. It is now up to us to make the most of the small pastures we may have.

The Growing of Animals and Fowls Is the Only Industry

in which farmers can engage whereby they may reap a harvest from their soil, and yet leave the earth in a higher state of fertility than when their operations were begun. Talk to me of impoverished soils, and I will talk to you of growing cattle. In the economy of God Almighty it has been fixed that we can grow crops of this character and grow rich. And in this presence I challenge the pages of history to produce the record of any agricultural people who have had enduring prosperity who have not followed this divinely appointed plan.

Four Per Cent. of Alabama Consumption of Beef and Pork Raised at Home.

A few days ago I was startled to read a statement from one of the instructors in the Agricultural and Mechanical College at Auburn wherein it was declared that of all the beef and pork consumed in the great State of Alabama, only 4 per cent. of it was raised at home. If I had been making a guess I would have named a higher figure, and if the instructor was correctly quoted it is to be presumed that he had information to back his assertion. But think of it. Before we reach the point of being self-supporting in this great State, our production of beef and pork will have to be increased 2400 per cent. Is it not the part of wisdom that we cry aloud in attempting to remedy this situation?

The Hardwareman as an Architect.

And delightful as it is to contemplate the many services we may render our farmer friends in attempting to increase their prosperity, we pass to the consideration of another of the many sides of the Hardware merchant's activities. It might not be amiss to say that the country Hardware store is expected to cover fields which are greatly subdivided among the city dealers. Most of the country stores handle more or less of the supplies which enter into the construction of buildings of various character. When a building is planned, or is about to be planned, we are often consulted in the light of an architect. Here we have an opportunity to make our impression upon civilization.

The march of human progress has been commemorated at various stages by the style of architecture which has obtained. No surer evidence of the character of our civilization can be erected. It is refreshing to observe an increased demand for architectural beauty, and wherever opportunity may present itself let us fail not to attempt to stimulate the education of these æsthetic tastes. By so doing we render services to our communities which may result in the accomplishment of good, the amount of which it may be difficult to estimate.

Bathtub Campaign Recommended.

And we are often called upon to furnish the plumbing supplies, as well as suggest the manner and character of installation. And when plumbing is mentioned it is doubtful if we realize the educational campaign needed in our midst on the doctrine of "soap and water." Whether we sell Bathtubs or not, let us preach the gospel of their liberal use. The amazing ignorance of many of our people upon the subject of cleanliness is nothing short of alarming.

I am fearful there are whole counties in Alabama where Bathtubs are scarcely known outside of the cities and towns. Some one has said that "cleanliness is next to godliness." If this be true, and if my fears as to the scarcity of Bathtubs be well founded, what a vast stretch of education is needed before we get away from habits of filthiness and are brought forth to that station next to godliness.

Cooking Utensils, Vehicles, Sporting Goods, Etc.

The opportunities for the accomplishment of good by the Hardware merchant are almost unlimited. We will not abuse your patience by attempting a discussion of more of them, merely suggesting our relation to wholesome and sanitary cooking in the sale of equipment necessary for it; our relation to good roads in the sale of Vehicles and Harness; our relation to healthful exercises in the sale of those things usually classed as Sporting Goods, as well as a multitude of other things with which the Hardware store is expected to abound.

MOST PROFITABLE METHODS OF ADVERTISING FOR THE COUNTRY STORE.

BY J. R. GAMBLE, WETUMPKA, ALA.

In my opinion there are at least four methods of advertising that can be made profitable to the Hardware dealers of the small towns:

1. Newspaper advertising.
2. Fence and tree signs and posters.
3. Show window advertising.
4. Circulars, leaflets and other advertising sent out by jobbers and manufacturers used in connection with personal work on the part of the dealer himself.

Newspaper Advertising Is the Medium Perhaps Most Commonly Used

by the country merchant, and the one from which he often derives the least benefit. Not because space in his county paper would not pay if properly filled with good reading matter, in which the farmer and his good wife would be interested, but for the fact that the advertisements of some of our country Hardware dealers remind one of the letterhead or billhead of his neighbor, the general merchant, which is something like this: "Office of John W. Jones, Dealer in Dry Goods, Notions, Hats and Caps, Boots and Shoes."

A little ancient, but it was good enough for his father years ago, and it hasn't been changed, although he hasn't had a pair of boots in his store for 10 or 15 years.

Of course the Hardwareman who thinks his card inserted in the weekly paper, for which he paid his good money, appearing week after week and month after month, and reading somewhat like this, "John Brown & Co., Shelf and Heavy Hardware, Tinware, Stoves and Ranges," may think he is advertising his business, but he is merely contributing his share toward keeping up the county newspaper.

Help from Makers and Jobbers.

But with the help he can secure from the jobbers and manufacturers in the way of valuable suggestions, and good cuts to attract attention to his advertisement, there is no excuse for the dealer letting his ad, though it be a good one, get stale. If we would make a study of advertising, selecting cuts of the proper size and in the right proportion, and if we would just think over the different lines that we could and should be advertising, our trouble would not be to think of something to take the place of the ad, which has been running so long that it reminds one of the appearance of Rip Van Winkle after his 20 years' sleep, but we would be trying to decide which lines we could best afford to leave out until the next change.

Never Advertise More Than One Line

at a time. One particular line advertised at a time, and at the right time, will bring better results than calling attention to several different lines in one advertisement. Change your ad often. Never let it run more than two or three issues of the paper, and here is where we country merchants are at a great disadvantage in newspaper advertising. The papers are published weekly, and, even if we change often, we cannot have more than 15 or 20 different ads during the year.

Where the Merchant Has It on the Expert.

It is well to get all the help you can from the advertising experts of the jobbers and manufacturers, but their ready made ads hardly ever seem appropriate for your particular trade. They do not know how to appeal to a dealer's home people as the dealer himself does; especially, if the

dealer studies his trade and knows the peculiarities of his customers as he should.

These experts can give you some very valuable points as to arrangement of advertising, the space required, the style of type, &c., but when it comes to describing the good points of a certain Plow to the farmers, or the cooking qualities of a certain Range to their wives, the dealer is better prepared to write up the copy of his ad than the other man, though he be an expert ad writer, for he knows the people he is trying to reach.

Therefore, it is my advice to get all the valuable information of this kind you can, get the ready made ads and study them, for there is much in them that you ought to know, and that you never would otherwise secure, with the good points got in this way, combined with your own plain, common sense, you will have an ad that will not only attract attention but bring results.

Two or Three Guaranteed Lines.

By all means have two or three guaranteed lines that you are continually bringing before the public's attention. I do not mean by this to fill your newspaper space with these and nothing else; but advertise them in the papers occasionally, and call attention, at the proper time, to them in circulars, posters, &c. For instance we have one particular line of Tools and Cutlery, one particular line of Paint and one particular line of Plows that we are always advertising in some way. We never let up, and the result is that we have built up a reputation on these three lines that has advertised us more than all the other advertising we have done.

Fence and Tree Signs and Posters.

The second method, the use of the fence and tree signs and posters, is good, but one of doubtful value. It will discourage any of us, when driving through the country, if we see the signs we have gone to so much trouble and expense to put up, cut to pieces by some 'possum hunter's ax, or perforated by pistol balls put there as the result of a near beer or White Top jag or a Wild Cat whiskey drunk.

It is a source of pleasure, however, to feel that you have the most attractive signs on the leading roads coming into town, and to know that the prospective customer is having it brought to his attention every few hundred yards that yours is the one place to buy cheap, for cash, the very best Stove or Range or Plow that is made. That these signs increase your sales to some extent there is no doubt, but they are very expensive, and unless they are placed with care on the most prominent roads, I doubt the use of them as being profitable advertising.

Show Window Effective Advertising.

Show window advertising I consider is the most attractive that can be done. But we believe there are comparatively few of the Hardware dealers in the smaller towns who take advantage of this cheap and profitable method of advertising.

It is true that some have good windows and trim them regularly, but there are hundreds of others who make practically no use of their windows other than to crowd them full of miscellaneous articles and leave them there indefinitely, to become dust covered and shopworn.

Some of the manufacturers are getting up attractive window trims and are doing a world of business in educating the dealers in window dressing. The trade papers are also doing an educational work along this line. The same idea should be carried out in window dressing, as in newspaper advertising. Never crowd your windows with a conglomerate mess of different kinds of articles. One line at a time, well and attractively displayed, is much better. Of course show window advertising is not as valuable to the country dealer as it is to his city brother, for comparatively few of his customers see any one display if his window is changed as often as it should be. If, however, he has an attractive window, one that will challenge the attention and admiration of the man from the country, he will be sure to tell his family and his neighbors about it, giving a description of the display.

Don't Crowd the Window.

I call to my mind especially one Sporting Goods window with which we took special pains. It is a very large window and we wired it from floor to ceiling with Poultry Netting, covered the floor with leaves and grass, put in a complete camper's outfit, consisting of a Tent, Guns, Hunting Coats, Caps, Shells, Cartridges, Bucket and Pan, pipe and tobacco, pet squirrels and rabbits, borrowed from friends, were seen running through a forest of small trees, and eating nuts, &c., with which they were generously being fed by small boys. A Pot hung on a tripod over some burnt wood and coals, an Axe was stuck into a burned and charred pine log, and a Lantern in which an electric light was placed hung in the door of the tent. At night the whole scene looked as if the fire had just gone out, and the hunters had turned in for the night. It attracted the attention of every one passing by and proved to be quite an advertisement for our Sporting Goods department. It is troublesome and somewhat expensive to decorate a large window in this way, but it pays well for all the trouble and expense. Of course it goes without saying that unless the windows are kept fresh looking and scrupulously clean they will produce exactly the opposite effect to that which is intended. They will repel rather than attract.

Window That Made a Hit.

It Pays to Take the Trouble.

Circulars, Leaflets and Personal Effort.

We now come to the fourth and last method mentioned, and the one I consider to be the most profitable to the country stores. I believe the very attractive and instructive printed matter sent out by the manufacturers and jobbers used in connection with the merchant's mailing list and handed out by his salesmen, wrapped up with purchases and inclosed with personal letters, bills and statements, to be the most valuable advertising the merchant in the small town can do.

It is true that much of this matter is entirely wasted by being placed on the counter to be blown about the store, where it is trampled on, and so soiled that it is unfit to be sent out, and, at best, only attracts attention of those who happen to come into the store. This, however, is the fault of the storekeeper, and the misfortune of the concern who sent the matter out.

The best method we have hit upon to keep this matter in order and ready for distribution is to have a shelf divided into sections just under the wrapping counter, where this matter can be so classified that the salesman can readily lay his hand on the particular kind to suit the customer waited on. In other words, we would not want our town customer to carry off in his or her package a lot of Cultivator or Disk Harrow advertising, nor would we care to place a circular advertising Tennis Balls or other Sporting Goods in the package of a farmer, who would be much more interested in the Cultivator or the Disc Harrow.

Shelf Under Wrapping Counter.

You can never tell when this class of advertising is going to bring returns. I had this fact brought forcibly to my attention only a few weeks ago, when one day an old negro walked into the store and called for a —— Axe. He said that he could not read himself, but that he had his little grandchild sit down and read the leaflet which was wrapped up with his purchase of a few days before clean through, and if the Axe was as good as that paper said it was he "sho wanted one of dem Axes." The consequences were he got the Axe he wanted; it sold itself; he went away satisfied, and we made a much better profit than we would have had we sold an unadvertised brand.

Selling an Axe.

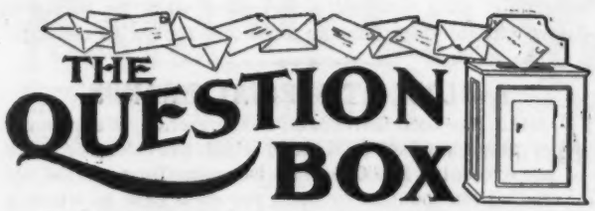
We cannot understand how any live hardware merchant can afford to fail to take advantage of this inexpensive and very profitable method of advertising. This method alone in connection with the merchant's personal work would keep his firm so prominently and favorably before the public that he could, if necessary, dispense with all other advertising, and hold his own with his competitors, who depend solely on newspaper advertising. By personal work, we mean the work of studying and catering to the wants of your customers. If you haven't what they want, get it—it makes no difference what it is—if it is in your line. Let them know that you are in the business to serve them to the very best of your ability. Shake hands with the men, be polite to the ladies, and always give them your personal attention, if possible, and, as advised by our national secretary, kiss the babies. We know men who live on such good terms with their customers that those customers enter their stores with smiles on their faces and outstretched hands, expecting nothing else than a whole-souled welcome and a hearty hand shake; and when a customer comes into a store in that manner, and you have the right kind of a salesman to handle him, he will certainly carry away with him the article for which he came.

Studying Customers' Wants.

It is the duty, it is the privilege and it should be the pleasure of every merchant to be, not only on friendly, but on the very best of terms with his customers. I know we very often hear such remarks as "It is a cold blooded business proposition" and "There is no sentiment in business," but there is sentiment in business, and the merchant who lives such a clean life morally that his fellow man has the utmost confidence in him; and if he can look his customer, to whom some great trouble or misfortune has fallen, straight in the eye, and can truthfully say, "God bless you, my friend, you have my profoundest sympathy"; or can actually rejoice with his friend and customer who has just harvested a bountiful crop, or to whom some other good fortune has come, is doing advertising, the result of which will last as long as life itself shall last.

Sentiment in Business.

The customer may forget the catchy ad in the newspaper, or the beautiful show window display, but he will *never* forget the man whose sympathy he had in time of trouble, or the man who rejoiced with him in his good fortune.



This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

Selling Stock to Farmers.

In former issues we have published a number of letters from merchants giving their views on the subject of incorporation, and especially selling stock in an incorporated company to farmers. Several of our correspondents whose opinions have been given a place in our columns have expressed their approval of this method of interesting farmers in the business. Other replies are set forth below. The first letter expresses the view of a New York State merchant, who points out some of the advantages of incorporating:

FROM NEW YORK: There are many advantages in incorporating. An important one is that in case of death your merchandise will not have to be thrown on the market at one-third or one-half its value. Neither will your store have to close for inventory, &c. The business goes right along and your family can sell their shares of the company if they wish to. You will find that most bankers look more favorably on incorporated companies than individuals. While we are a close corporation, we have to let our men have a little stock, as it makes them more interested in the success of the company. We have not tried to interest any outsiders in our company, but if we did, think the plan of getting some of the best farmers to take a small amount of stock would be a good plan. Our conditions are nearly identical with that of your inquirer, located in a prosperous farming community. We have been incorporated for nine years and like it much better than the old way.

The View of Bankers.

A Less Favorable View

is taken by a number of other merchants, and it must be admitted that they seem to have had more opportunity for observation or to have given the subject more thoughtful consideration. A Maine merchant writes:

From our point of view it seems to us as if the scheme outlined would prove a success only in exceptional cases.

FROM A PENNSYLVANIA HOUSE: We know of an instance where the distribution of stock among farmers proved a failure, although a considerably larger percentage than 15 per cent. of the capitalization was subscribed for by them. In the case quoted the difficulty arose from an overdesire on the part of all the stockholders to have too much to say in the management of affairs, and in our humble opinion the amount of stock purposed to be circulated in your arrangement would bring better results if expended in good legitimate advertising. We believe in corporate bodies where a strong business board is maintained, but the farmer aggregation does not appeal favorably to us.

Stockholders Wanted o Manage.

FROM A FIRM IN ILLINOIS: We question whether it would pay to sell stock in a concern to the influential farmers in the near neighborhood of the town. In the first place, every one to whom stock was sold would expect a special concession in price or else they would not care to purchase the stock. Again, there is a natural jealousy between neighbors which might possibly create an antagonistic feeling toward the store for the reason that the farmer who owns no stock would imagine that his neighbor was buying goods for less money than himself. Then there are many years in the experience of most merchants in which the profits are not large enough to declare a dividend. In this case the stockholders would become dissatisfied. In regard to incorporating we hardly know what to say. An incorporated company naturally does not obtain as large a degree of credit as a concern not incorporated, because the liability is limited to the capital invested. Possibly it is a safer way to do business if one does not want to pay all their debts in case of failure and there are some nice things about it. We think it depends largely upon circumstances.

Jealousy Between Neighbors.

Ideas About Incorporating.

Departments in Hardware Stores.

We are in receipt of the following communication from a prominent and well equipped house in Ohio, which carries a large and varied stock of Hardware, House Furnishings, supplies, &c. It relates to the matter of dividing the Hardware store into departments, a subject on which we have published a number of interesting letters. This house has evidently given the matter a great deal of study and their letter affords many helpful suggestions and valuable information:

We believe it will pay any Hardware dealer to departmentize his store, unless his store is so small that he can keep track of all the details all the time. It can be carried as far as desired, but each additional department means an additional amount of pricing and listing sales, and adds to the difficulty of dividing expenses among the departments in an equitable manner.

Care in Making Department Divisions.

Great care should be taken in making the divisions of stock into departments. The greatest benefit to be derived is from comparisons from year to year, and if changes in stock are made these comparisons are not a true index. If, after a year's trial, more divisions are wanted it is better to subdivide some of the existing departments than to create new ones from several or all of the departments, for the reason that the combined sales or expenses of the subdivided departments can be compared with the original ones.

Importance of Comparisons.

It is a simple matter to divide goods according to natural classifications, when the departments contain goods for totally different uses—namely, to separate a stock of Hardware, House Furnishing Goods and Sporting Goods into three departments, under these heads. If the Hardware stock is made up of Shelf and Builders' Hardware, Tools, Contractors', Blacksmiths' and Factory Supplies, and a further division is desired, the question incidentally arises, whether to carry Wrenches and Machinists' Hammers and tools, &c., in a "supply" department or to place them with the other tools in the Hardware department?

Questions Which Arise.

Keeping Goods Together.

We have found that it is much easier to keep track of sales and to divide expenses, if all the goods in a department are kept together. In some cases it is not advisable to divide according to *kinds* of goods; as, for instance, Pipe, Nails, Building Paper, Plows, &c., can be handled and sold more advantageously from a warehouse or stockroom, and it simplifies matters to group some items in a department, even though under

Practical Considerations.

THE QUESTION BOX CONTINUED

other conditions they would be classified in different departments. The cost of selling, cost of handling, available space, familiarity of salesmen with certain lines of goods, all enter into consideration.

A Just Division of Expenses.

The most difficult proposition of all is to divide expenses of doing business and do justice to all departments. Expense includes those expenses which are incurred for the benefit of one department to the exclusion of all others, and "general expenses," which are for the maintenance of all. "Direct" expenses consist of salesmen's salaries, fixtures, advertising and repairs; the balance or "general" expense may be divided in a rough way into general, house, office, delivery and rent expenses.

Direct and General Expense.

The proper charge for rent may be determined by the amount and value of space occupied. House expense, light, heat, janitor's salary, &c., according to amount of floor space. Insurance, amount of stock. Office expense by amount of charge, sales, &c. Floor space, investment, sales, character of business, all have to be taken into consideration. It is largely a matter of judgment. If the percentages are revised every three months, a fair division of expense can be made.

Judgment in Apportionment.

Departments Stand on Their Own Bottom.

Each department is charged with the direct expenses and its share of the general expense, and all purchases, and is credited with the sales. At the end of the year each department, after the inventory is taken, stands on its own bottom, and it's a case of win or lose.

Frequent Department Inventories.

If desired an inventory of any single department can be taken during the year. In times, like the present, when business is conducted on such a close margin, a per cent. or two means loss or gain. Some strictly wholesale concerns keep a running inventory, others price up every article sold at cost every day. This is impossible in retail stores on account of the multitude and diversity of small sales.

Estimating Profits.

To get a fair idea of gross profits, one department at a time can be taken for a month. All goods sold, priced up at cost and a gross profit figured. If there are four departments, each department can be figured every three months. These percentages hold good during the intervening months. In this way an estimated profit can be carried on till the end of the year until the actual profit is determined by the inventory.

Varying Percentages of Profit.

The percentage of profit is not constant. There are certain seasons when a larger amount of low or high profit goods are sold than the average. This raises or lowers the percentage. For instance, large sales of Fence Wire lowers the percentage in the spring, and increased business in Cutlery and Novelties raises the percentage in December.

Necessary Allowances.

Goods get broken or shop worn, articles are given away, parts misplaced, or lost; these things do not show on a cost sheet, and if a certain percentage is not added to the cost to cover, the estimated profit and actual profit at the end of the year will not agree.

The Value of Cost Systems.

A cost system may be simple or complicated. The more it is carried into detail, the more chance for comparisons, but there is a place if carried too far where the benefits to be derived will not pay for the operating cost. Each merchant will have to determine for himself how far he shall go, for many of the so-called experts and business organizers are more interested in selling special stationary than in perfecting a simple, workable plan that will tell a merchant what he wants to know without tying him up hand and foot with red tape.

A BLOW AT SPECIAL BRANDS.

A BILL has been introduced in Congress by Representative Campbell of Kansas which provides for a fine of not exceeding $1000, or imprisonment for a period not exceeding six months, or both, for each case in which a manufacturer places any other than his own name on an article produced by him. It is entitled "A bill prohibiting fraud upon the public by manufacturers by placing any other than their own name upon a manufactured article," and reads as follows:

> *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That section one of an Act entitled "An Act to regulate commerce, approved February 4, 1887," be amended so as to read as follows:
>
> SECTION 1. The provisions of this Act shall apply to any person, firm, company, or corporation engaged in the production or manufacture of any article or commodity that enters into interstate and foreign commerce.
>
> It shall be unlawful for any such person, firm, company, or corporation to print, emboss, or stencil, or to in any way place the name of any other than his or their own name upon such article as is manufactured by such person, firm, company, or corporation, and any other name or title whether real or fictitious, placed upon any article so manufactured than that of the person, firm, company, or corporation so manufacturing it shall be deemed an attempt to defraud.
>
> It shall be unlawful for any person or persons to erase or change the name of the manufacturer or manufacturers of any article mentioned in this.
>
> Any person or persons, firm, company, or corporation offering for sale or rent or otherwise disposing of any property intended for interstate or foreign commerce, shall furnish therewith the name of the manufacturer or manufacturers of said commodity or article.
>
> Any person, firm, company, or corporation violating the provisions of this Act shall be guilty of a misdemeanor, and fined in a sum of not exceeding $1000, or imprisoned for a period of not exceeding six months, or both such fine and imprisonment as the court may direct.
>
> This Act shall be in effect from and after its approval by the President.

The bill has been referred to the Committee on Interstate and Foreign Commerce.

HENRY DISSTON & SONS, INC., Philadelphia, Pa., have issued two attractive and conveniently arranged pocket size catalogues, one referring to Hand Saws of all kinds, Trowels, Machinists' Tools, Bevels, Levels, Files, Screw Drivers, &c., and the other to mill goods, including Circular Saws, both Solid and Inserted Tooth Band Saws, Mandrels, Swages, Machine Knives, &c.

WILLIAM HURLEY AND HENRY MARDT have recently commenced business under the name of the New Haven Novelty Company, at 28 Whitney avenue, New Haven, Conn. They will manufacture a line of patent Wrenches, Service Gauges, Gas Heaters and Metal Novelties.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio, has lately taken possession of its new administration building, which cost about $90,000. The building is of Colonial architecture, 65 x 110 ft., two stories and basement. It is a very handsome and elaborate structure of brick, with white marble trimmings and artistic columns across the front. It is thoroughly fireproof, and the entire equipment is strictly modern. The first floor is devoted entirely to the advertising, Jap-a-lac and general sales departments, while the second contains the offices and board rooms, legal, credit, accounting, purchasing and traffic departments. On the third floor is a rest room, library and convention hall. Fine lavatories and shower baths for the use of the office force, numbering about 100, are in the basement. Daily lunch is served in a dining room on the main floor, where 94 people were seated and served on the day the building opened.

MAKING GOOD IN BUSINESS

HINTS AND SUGGESTIONS FROM MANY SOURCES

Maxims from the Latin.

There is no excellence without difficulty.—*Ovid.*

Do not yield to misfortunes, but meet them with fortitude.—*Virgil.*

Advise well before you begin: and when you have decided act promptly.—*Sallust.*

Diligence has very great power; we must cultivate it carefully. There is nothing which it does not accomplish.—*Cicero.*

A Great Art.

THE art of talking is one of the most valuable equipments a business man can have. Nearly all work that is above mere routine and physical labor involves talking, and the success of the work often depends on the ability to carry the point in conversation. The difference between a skilled and unskilled talker is very great. The importance of knowing how to talk well is not generally appreciated.

Many who think they are proficient in the art are as self-deceived as the novice in poetry writing. A really skillful talker is rare, because little or no systematic attention is paid to cultivating the art. Instead of being allowed to develop in a haphazard manner, picking up a point here and another there, talking should be the subject of study almost as thoroughly as that given to painting, writing or music.

A man may have good ideas, but if he does not know how to present them intelligently they may never attain proper recognition. If a man would acquire information from others he must know how to draw them out. The difference between a good salesman and a poor one is often a matter of knowing how to talk. And the manager who gets the most out of his men is the one who knows how to talk to them in a manner that will stir their enthusiasm, quickening and encouraging them to put forth their best efforts. At every turn the art of talking is a vital factor in success.—*W. P. Warren.*

Picking Up Chances.

Somebody says that we do not succeed so much by our own acts as in profiting by the mistakes of others. When people who have a good start in life fail to improve their chances, the chances are left for the rest of us. Inheritance and pull count only at the start; the race is to the best man. The fellow without the help at the start often gets into the game and secures for himself what the inheritance man might have had.

Alertness and New Methods.

So rapid have been the changes in business methods within the last five years that a man who hopes to keep in the race must be alert and ready at any moment to change his methods and take advantage of every progressive step in the matter of better system that offers. And if he is not prepared to do this he may as well shut up shop and retire at once, for the business struggle has become so strenuous that only those who are able to adapt themselves to the conditions of to-day, no matter how radically they may be at variance with those of yesterday, have reasonable hope for success.—*John Farson.*

Wise Direction.

The responsible head of any company should see to it that there are placed at the heads of the various departments under him men who will realize the necessity of tactful treatment of those with whom they come in contact. The methods of the various employees will in most cases be found to be in line with the methods of the head of the department, and for this reason SUAVITER IN MODO, FORTITER IN RE, mildness in method, force in execution, should be the governing principle for all heads of departments.—*John W. Ferguson.*

The Personal Element.

The machinery of business is only an accessory; it must be vitalized, if it is to be successful, by a personal equation which attracts instead of offends. It makes no difference whether this quality of pleasing is inherent, or is the result of genius, or is acquired by a studied effort, it is both a powerful and an indispensable thing in business.—*Printers' Ink.*

Attracting Notice of Superiors.

The condition precedent for promotion is that the man must first attract notice. He must do something unusual, and especially must this be beyond the strict boundary of his duties. He must suggest, or save, or perform some service for his employer which he could not be censured for not having done. When he has attracted the notice of his immediate superior, whether that be only the foreman of a gang, it matters not; the first great step has been taken, for upon his immediate superior promotion depends. How high he climbs is his own affair.—*Andrew Carnegie.*

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM WICHITA HARDWARE COMPANY, Wichita Falls, Texas, which is conducted under this title by R. G. Scheurer, who recently closed out his business at Vandalia, Ill., and will handle Hardware, Gas Fixtures, Plumbing, Harness, Vehicles and automobile and vehicle work.

FROM HUGH STRONG, Huntsburg, Ohio, who has opened a retail store, handling Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Glass, Agricultural Implements, Sporting and Athletic Goods and Bee Supplies.

FROM CHAS. E. WHITNEY, 3101 W. North avenue, Baltimore, Md., who has just opened with a new stock of Hardware, Paints and House Furnishings.

FROM FRANK G. SMITH, Plymouth, N. H., who wishes catalogues of Shelf and Heavy Hardware, Paints, Explosives, Builders' Supplies, &c.

THE CHANDLER & FARQUHAR COMPANY, Boston, Mass., gave its annual banquet to the Chandler & Farquhar Associates, an organization of employees, at the American House on the 4th inst. President Charles S. Farquhar of the company was the toastmaster and gave an interesting account of his experience in the trade, and spoke in a most hopeful manner of the outlook. After brief remarks by other members a programme of music and readings concluded the evening.

A NEW FOLDER in their series of advertising talks addressed to salesmen has been issued by E. C. Atkins & Co., Indianapolis, Ind. It is entitled, "If I Could Meet You."

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

AMERICAN SILVER COMPANY, Bristol, Conn.: Illustrated catalogue richly got up referring to World Brand Silver Ware; also booklet referring to American Automatic Coffee Filters.

AMERICAN STEEL & WIRE COMPANY, Chicago: Booklet referring to Rail Bonds and Appliances; also booklet referring to Royal Fence.

BOSS WASHING MACHINE COMPANY, Cincinnati, Ohio: Attractive and handsomely illustrated booklet, entitled "The Only Way," and referring to Boss Washing Machines.

NATIONAL MACHINE & STAMPING COMPANY, Detroit, Mich.: Booklet illustrating and describing in detail the Sanitary Dish Washer, and giving numerous testimonials.

GOODELL COMPANY, Antrim, N. H.: Catalogue D, illustrating and listing without prices an extensive line of Table Cutlery, Steels, Special Knives, &c.

C. E. JENNINGS & Co., 42 Murray street, New York: Illustrated booklet of C. E. Jennings' Arrow Head Hack Saw Blades and facsimile illustrations of various ways of packing, suitable for different purposes.

PAXTON & GALLAGHER COMPANY, Omaha, Neb.: Large catalogue well illustrated and arranged referring to goods included in Department E, comprising Builders' Hardware, &c.

LAKE ERIE NAIL & SUPPLY COMPANY, Cleveland, Ohio: Catalogue B, a substantial illustrated edition of more than 400 pages, with full lists and descriptions referring to an extensive line of Hardware, Mill and Factory Supplies.

JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J.: Convenient pocket edition of illustrated catalogue referring to Graphite Products, including Crucibles, Facings, Lubricating Graphite, Greases, Pencils, Protective Paint, &c.

The Pittsburgh Conventions.

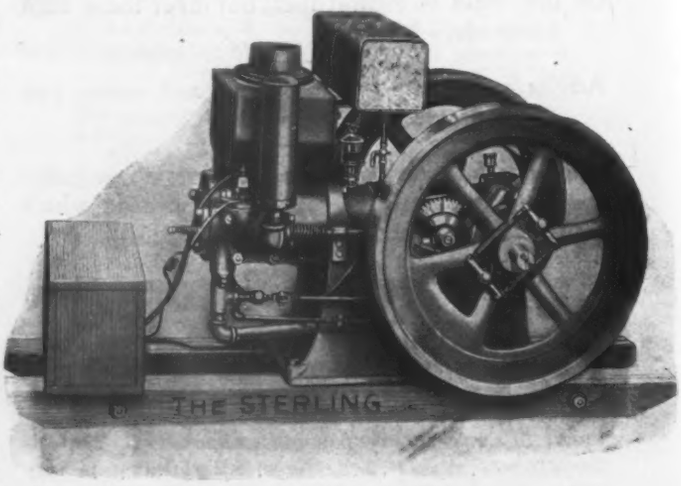
THE great manufacturing industries of Pittsburgh are taking a very lively interest in the coming joint conventions of the American Hardware Manufacturers' Association and the Southern Hardware Jobbers' Association, which will be held on June 9, 10 and 11, the headquarters of the two associations being at the Fort Pitt Hotel and the Schenley Hotel, respectively. On the Pittsburgh Entertainment Committee are many of the most prominent officials of the big iron and steel concerns of the city. Among the entertainment features will be a smoker, dance, musicale, banquet, trolley trips around the principal steel and iron works, with teas, band concerts and receptions for the wives of those who attend the conventions. Automobiles and taxicabs will be provided without charge and every effort will be made to make the coming gathering the most enjoyable in the history of either association.

Arrow Head Hack Saw Packages.

C. E. Jennings & Co., 42 Murray street, New York, are packing their Arrow Head hack saw blades in variously colored pasteboard packages, according to the purpose for which they are suited, so as to indicate at a glance the suitability of the blades contained for a given purpose. For instance, those with 14 teeth to the inch are especially adapted for fast, deep and heavy cutting; also for machinery steel, solid copper, &c., and are printed in green and white. Blades having 18 teeth per inch for general use, tool steel, solid brass, thick pipe, &c., and are in yellow and black. Those with 24 teeth, for cutting tubing and all other metals, are put up in blue and white, while the 32 teeth to the inch style, for cutting nickeled tubing or any fine work, are in brown.

The Sterling Gasoline Engine.

In response to the increasing demand for small unit gasoline engines for use upon the farm and in small shops, the Charter Gas Engine Company, Sterling, Ill., is making the Sterling engine here shown. It is especially adapted to such motive power service as is required for pumps, cream separators, grinders, fanning mills and other machinery of limited power requirements about

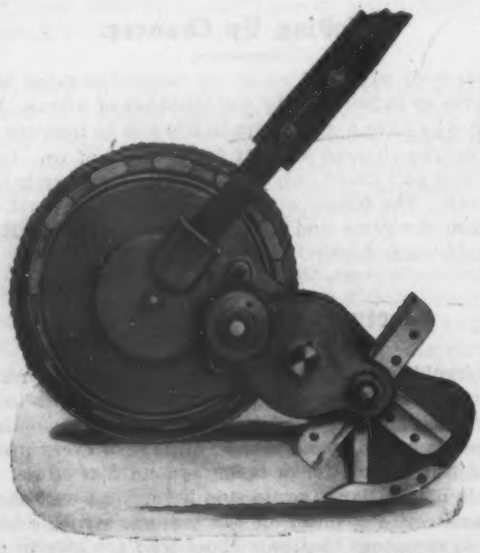


The Sterling Gasoline Engine.

the farm. This engine is built in units of 2½ and 3½ hp., and is compactly mounted on skids, as illustrated, for convenient removal from place to place as needed. It is similar in type and construction to the larger units made by the company. It is furnished with the open jacket cylinder and water gauge glass showing hight of water in the tank. There is a gasoline tank mounted on the engine and the battery box supplying the jump spark ignitor rests on the skids. A special spark controller prevents the spark at ignitor except when fuel has been admitted by the governor. The entire equipment occupies a floor space of 2½ x 5 ft., and the shipping weight is 750 lb.

Vertical Lawn Edger.

The Granite State Mowing Machine Company, Hinsdale, N. H., is marketing the Vertical lawn edger with



Vertical Lawn Edger with Long Handle.

long handle shown herewith. It is offered for trimming the grass overhanging the edges of walks, driveways and

curbs, and is particularly suited for such conditions, involving much labor, as are found in large grounds, parks and cemeteries, where this work heretofore has been laboriously accomplished with hand shears. It may be operated as fast as the individual can walk, the hardened tool steel finger picking up the overhanging grass preparatory to cutting, the depth of which may be regulated at pleasure. The special stud bearing is of hardened tool steel and heavy coil springs cause a shear cut with the four revolving knives, both stationary and revolving knives being made of high grade crucible steel hardened in oil. Various patents have been obtained by the company both here and abroad.

Clyde Cutlery Company.

The Clyde Cutlery Company, Clyde, Ohio, and 25 Warren street, New York, in its latest catalogue, illustrates and describes several new articles, including the Clyde lunch knife, through tang, box wood handle, brass riveted, with fine polished blade 7½ in.; Clyde bread knife, 9-in. blade, bolstered stag handle, brass rivets; a line of cooks' knives, in three groups of eight lengths of blade each, 5 to 14 in. long, with cocobolo, ebony and box wood handles, all brass riveted; broom corn knife, 4½ and 5½ in. blades, solid maple handles, also grape hook and grape knife, blades 2¼ and 3 in., respectively, with maple handles; a shoe knife in 3½ and 4 in. blades with maple handle and brass ferrule; pruning shear, with 4-in. steel ferrules and caps, handles 20 to 26 in., and new style of hand pruning shear and grape shear.

Weber Cabinet Scraper and Sandpaperer.

The Weber Mfg. Company, West Allis, Wis., is putting on the market a cabinet scraper and sandpaperer for the use of carpenters, cabinet makers, painters, interior wood finishers and furniture manufacturers. The device as illustrated is said to embody features which will be appreciated by the practical mechanic, enabling the operator to secure and maintain a firm hold and perfect control of the tool even under adverse circumstances and in tight corners. The knife in the scraper is fastened with a clamp having no holes or slots. Any length of knife can be accommodated by the clamp, and it can be utilized until only ½ in. remains. The device is reversed for sandpapering purposes as desired. Two or three sheets of sandpaper can be placed in the clamps, and after one is worn smooth it can be torn off, uncovering a fresh one to take its place. By removing the sandpaper and substituting emery cloth the tool can be used by machinists for polishing purposes. The entire device weighs only 22 oz.

Weber Cabinet Scraper and Sandpaperer.

King of All Razor Blade Stroppers.

John G. Bestgen, 161 Summer street, Boston, Mass., is the patentee and manufacturer of the King of All Stroppers, designed for resharpening all wafer razor blades, double or single edge. The construction is such that even double edge blades may be stropped on both edges without removing the blade or changing its position. Special features of construction are the even balance and correct thickness, which, it is said, assure a proper bevel and even stroke.

King of All Razor Blade Stropper.

Fleming Razor Stropper and Honer.

The Fleming Sales Company, 253 Broadway, New York, is now prepared to execute orders for the Fleming razor stropper and honer, recently brought out. It is made of high grade steel and brass, according to the duty required of each, polished and nickeled and fitted with an ebonized wood handle. It is 7¼ in. long over all and weighs 4 oz. It will automatically strop and hone any kind of a razor blade whether single or double edge wafer, reinforced or hollow ground safety blades or the ordinary handled long blades longer used. Any form of razor blade manufactured may also be honed on a stone, natural or manufactured variety, with this implement, the movement being reversed in honing, however, when the edge precedes the instrument. In either stropping or honing, the heel to point movement practiced by professionals is easily performed. The automatic action is accomplished by merely moving the stropper and honer backward and forward on strop or stone, the resulting friction on the angular bottom plate by means of the toothed members at each end reversing the holder containing the blade. Double or single edged wafer blades are held in a sheet metal spring holder with two holes and which is slipped into the permanent holder, but blades having thick backs, safety or ordinary patterns, are placed directly in the main holder, indicated by the diamond shape spring slots. In this connection the company is also offering a high grade razor hone and a genuine shell horsehide strop, the three articles being separately and neatly put up.

Fig. 2.—Stropping a Wafer Blade.

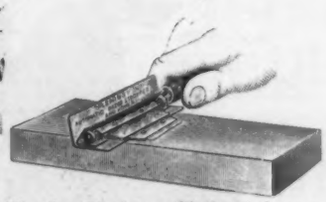


Fig. 3.—Honing a Blade of Any Kind.

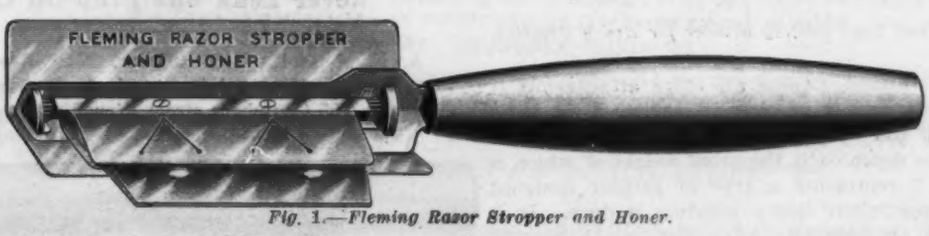


Fig. 1.—Fleming Razor Stropper and Honer.

Hand and Foot Power Grinders.

Included in a line of new hand and foot power grinders manufactured by the El Starr Mfg. Company, Milwaukee, Wis., are the styles here illustrated. Fig. 1 represents the Godfrey grinder No. 2, which is designed for heavy work of a general character, such as is required about house, farm and shop for grinding knives and other edge tools. It is fitted with extra attachments to facilitate various grinding operations, such as the sharpening of tools, as indicated in the illustration. It has a double adjustable tool rest with shear grinding guide and chisel attachments made of malleable iron, and is also provided with a practical chain adjustment.

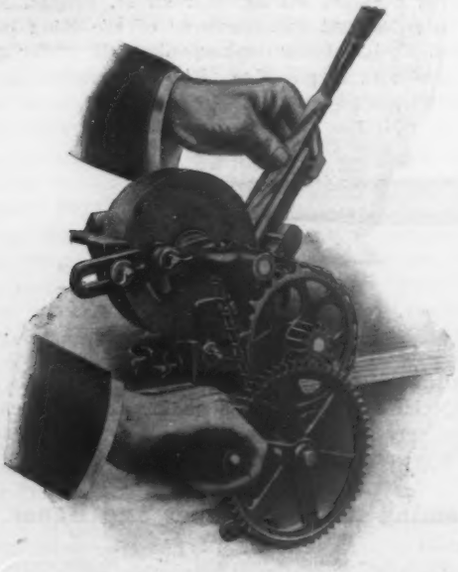


Fig. 1.—Godfrey Grinder No. 2.

Fig. 2.—Two-Wheel Type Godfrey Grinder for Heavy Grinding.

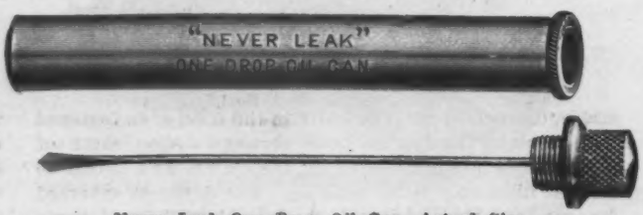
This tool is furnished without the extra attachments if desired. It measures 14 in. over all, carries a 5¼ x 1¼ to 1 in. wheel, and weighs 10 lb. The tools are packed in crates of one dozen each, the gross weight of which is 160 lb. Fig. 2 represents a type of grinder designed for use in shops where heavy grinding is done. It is equipped with an especially large rest, which may be easily adjusted to suit different kinds of work. A special twist drill holder made by the company is used in connection with these rests, and is particularly serviceable as an attachment for this machine, which measures 18 in. in hight and carries two wheels 6 x 1¼ and 1 in. The Acme and Lightning Bi-Pedal foot power grinders shown respectively in Figs. 3 and 4 are built for general service, being mounted on rigidly braced steel frames. Both of these machines have pedals fitted with roller clutches which catch instantly, giving a steady motion to the driving mechanism. The wheel shaft runs in babbitted bearings, and the large gear wheel on the Bi-Pedal grinder serves the purpose of a flywheel. These machines stand 40 in. high, Fig. 3 taking wheels 6 x 1 in. and Fig. 4, 8 x 1¼ or 1 in., for which 10 x 1½ in. can be substituted if desired.

Fig. 3.—Acme Foot Power Grinder.

Fig. 4.—Lightning Bi-Pedal Grinder.

Never Leak One Drop Oil Can.

A. F. Meisselbach & Brother, 22-28 Prospect street, New York, represented by the J. A. Jochum Hardware Company, 105 Chambers street, New York, are marketing the Never Leak One Drop Oil Can. It is 3½ x ⅜ in., made of drawn brass tubing, nickel plated. It is de-

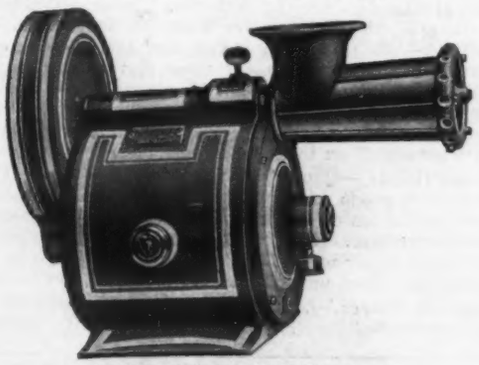


Never Leak One Drop Oil Can, Actual Size.

signed more especially for depositing a single drop of oil in connection with clocks, guns, music boxes, phonographs, typewriters, sewing machines, fishing reels or any part requiring but a small amount of lubricant, and may be carried in pocket or case without soiling other articles.

Holwick Motor Driven Meat Chopper.

B. C. Holwick, Canton, Ohio, is manufacturing an electric driven meat and food chopper, here illustrated, which has a capacity of 300 lb. of meat per hour. The machine is portable and the chopper may be instantly detached by loosening a thumb screw. Each machine is furnished with four sets of knives and blades, which it is stated can be resharpened at slight expense. One-half horsepower Westinghouse alternating current motors or Robbins & Meyers direct current motors are furnished as required, and their operation is said to be practically noiseless. It is claimed by the manufacturer that this machine will not heat or discolor meat or food, the cutting process being the same as with a pair of shears. Strings, sinews or gristle cannot pass through without being chopped. The average cost of operation is said to



Holwick Electric Meat Chopper.

be but 3 cents per 100 lb. The machine is 15 in. high and weighs but 20 lb. It occupies 10 x 12 in. of counter space.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal. 5 bbl. lots.
Linseed, Western, Raw	.55 @56
State, Raw	.55 @56
City, Raw	.56 @57
Boiled, 1¢ ℔ gal. advance on Raw.	
Raw, Calcutta, in bbls	.75 @..
Lard, Prime, Winter	.80 @83
Extra No. 1	.52 @53
No. 1	.47 @49
Cotton-seed, Crude, f.o.b. mill	.35 @36
Summer, Yellow, prime	5.77@5.85
Summer, White	6 @6.05
Yellow, Winter	5.95@6.10
Tallow, Acidless	.56 @..
Menhaden, Brown, Strained	.32 @33
Northern, Crude	@..
Southern	.22 @23
Light Strained	.32 @33
Bleached Winter	.36 @..
Cocoanut, Ceylon ℔ lb	6¾@..
Cochin ℔ lb	6⅞@..
Cod, Domestic, Prime	.38 @..
Newfoundland	.40 @..
Red Elaine	.43 @47
Saponified ℔ lb	5¾@ 6¾
Olive, Yellow	1.40@1.50
Neatsfoot, Prime	.55 @56
Palm, Lagos ℔ lb	5.60@5.65

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	12½@13
29 gravity, 15 cold test	13½@13¾
Summer	12 @12½
Cylinder, light filtered	20 @20½
Dark, filtered	17½@18
Paraffine, 903-907 sp. gravity	14 @14½
903 sp. gravity	13 @13½
883 sp. gravity	10½@11
Red	13 @13½

Miscellaneous—

Barytes:	
White, Foreign ℔ ton	$18.50@20.50
Amer., floated ℔ ton	17.00@18.00
Off color ℔ ton	12.50@15.00
Chalk in bulk ℔ ton	3.00@ 3.10
China Clay, Imported ℔ ton	11.50@18.00
Cobalt, Oxide ℔ 100 lb	1.45@ 2.60
Whiting, Commercial ℔ 100 lb	45@50
Gilders ℔ 100 lb	.52@ .64
Ex. Gilders ℔ 100 lb	.56@ .68

Putty, Commercial—℔ 100 lb

In bladders	$1.70@2.00
In bbls. or tubs, 100 lb	1.20@1.45
In 1 lb to 5 lb tins	2.65@3.25
In 12½ to 50 lb tins	1.59@1.90

Spirits Turpentine— ℔ gal.

In Machine bbls	41½@42
In Oil bbls	42 @42½

Glue—

	℔ lb
Cabinet	.12 @15
Common Bone	7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.19 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.18 @24

Gum Shellac—

	℔ lb
Bleached, Commercial	.16 @16½
Bone Dry	.20 @21
Button	.20 @30
Diamond I	.27 @28
Fine Orange	.20 @21
A. C. Garnet	15½@16
Light Orange	.17 @19
Kala Button	.11 @12
D. C	.27 @28
Octagon B	.22 @23
T. N	.14 @15
V. S. O	.25 @26

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @15
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White and Red, Lead &c.—

	℔ lb
Lead, English white, in Oil	.10½@10¾
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	6¾
Dry and in Oil, 25 and 50 lb kegs	7
Dry and in Oil, 12½ lb kegs	7¼
In Oil, 25 lb tin pails	7¼
In Oil, 12½ lb tin pails	7⅝
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	8¼
Red Lead and Litharge:	
In 100 lb kegs	7
In 25 and 50 lb kegs	7¼
In 12½ lb kegs	7½
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	℔ lb
American, dry	5½@ 5⅝
Red Seal (French process)	6¾@ 7
Green Seal	7¼@ 7½
German Red Seal (French process)	7 @7¼
Green Seal	7½@ 7⅝
White Seal	8¼@ 9
French, Red Seal	8⅜@ 8⅞
Green Seal	10⅜@10⅝

Dry Colors—

	℔ lb
Black, Carbon	6¼@10
Black Drop, American	3¼@ 9
Black Drop, English	5 @15
Black, Ivory	.16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	.30 @31
Blue, Prussian, Domestic	.28 @30
Blue, Ultramarine	.5 @15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.00@3.10
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Ocher, American ℔ ton	$12.00@15.00
American Golden	4 @ 5
French	1¼@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	.10 @12
French	12¾@13
German	.12 @13
American	8½@10
Red, Indian, English	5 @ 7
American	3 @ 3½
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer. ℔ 100 lb	$0.75@1.50
English ℔ 100 lb	$1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	2¼@ 3
American Burnt and Pow'd	.2¼@ 3
Talc, French ℔ ton	$18.00@25.00
American ℔ ton	15.00@25.00
Terra Alba, French ℔ 100 lb	.80@1.00
English ℔ 100 lb	.90@1.00
American ℔ 100 lb, No. 1	.75@ .80
American ℔ 100 lb, No. 2	.60@ .65
Umber, T'key, Bnt. & Pow.	2½@ 3
Turkey, Raw and Powdered	2½@ 3
Burnt, American	2 @2½
Raw, American	2 @ 2½
Yellow, Chrome, Pure	12¾@14
Oxide Red, American	2 @ 7½
Vermilion, English, Imported	@70
Chinese	$0.90@1.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic....33⅓%
North's 10%
Upson's Patent, ₩ gro., $29.90....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent....10%
Ives' Stop Bead Screws and Washers 10%
Taplin's Perfection....10%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—
Fernald Mfg. Co, Burton Anti-Rattlers, ₩ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₩ doz. pairs ....$2.00@$3.00

Anvils—American—
Eagle Anvils ....₩ lb @9 ¢
Hay-Budden, Wrought....9½@9¾ ¢
Trenton ....₩ lb 9½@9¾ ¢

Imported—
Swedish Solid Steel Paragon, ₩ lb ....10@10½ ¢
Swedish Solid Steel Sisco, Superior, ₩ lb....10@10½ ¢
Peter Wright & Sons, ₩ lb, 84 to 340 lb, 11¢; 350 to 600 lb, 11½ ¢.

Anvil, Vice and Drill—
Millers Falls Co., $18.00....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co....10%

Augers and Bits—
Com. Double Spur....30%
Jennings' Pats., Bright....65&10@70%
Black Lip or Blued....65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&12&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....60%
Snell's Car Bits, 12-in. twist....60%
Snell's King Auger Bits....50%
Swan's ....65&10@70%
Swan's, Jennings' Pattern....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18....60&10%
Ford's, Clark's Pattern....60&5@60&10%
C. E. Jennings & Co., Steer's Pat....25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dbl. Cut....$3.00@$3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$5.50@$6.00
Ames ....20&10%
Universal 20%

Ship Augers and Bits—
Ship Augers....40&10@—%
Ford's ....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ....33⅓&7½%
Snell's 60%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled....*gro. $2.75@$3.00*
Unhdld, Shldered..gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@31¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Elmore Tool Mfg. Co.:
Tinners' and Brad Awls....35&7½%
Scratch Awls....60%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—
See *Grease, Axle.*

Axles—
Iron or Steel.
Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar....4½&5 ¢
No. 1 Common, Loose...3½@4 ¢
No. 1½ Com., New Style..4¼@4¾¢
No. 2 Solid Collar....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12....70%
Nos. 13 to 14....70%
Nos. 15 to 18...70&10@70&10&5%
Nos. 19 to 22...70&10@70&10&5%

Boxes, Axles—
Common and Concord, not turned....*lb., 5@6¢*
Common and Concord, turned, lb., 6@7¢
Half Patent....*lb., 9½@10¢*

Bait—Fishing—
Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances—Sash—
Caldwell new list....50&10%
Pullman ....50&10%

Spring—
Light Spring Balances..60@60&5%
Chatillon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¼@2½¢

Towel—
No. 10 Ideal, Nickel Plate..₩ gro. $3.50

Beam, Scale—
Scale Beams....40%
Chattillon's No. 1....30%
Chatillon's No. 2....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₩ doz, $0.80; Tinned $0.85
No. 11 Wire Coppered ₩ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned....₩ doz. $1.50

Beaters Egg—
Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 153, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 360, Mammoth, per doz., $25.00.

Bellows—
Blacksmith, Standard List:
Split Leather....60&10@65%
Grain Leather....50@60&10%

Hand—
Inch..	6	7	8	9	10
Doz..	$5.00	5.50	6.00	6.50	7.50

Molders—
Inch..	10	12	14	16
Doz..	$7.50	9.00	12.00	15.00

Net Prices.

Bells—Cow—
Wrought Cow Bells....75%
Jersey ....75&10%
Texas Star....50%

Door—
Home, R. & E. Mfg. Co.'s....55&10%

Hand—
Polished, Brass....60@60&10%
White Metal....60@60&10%
Nickel Plated....50&10%
Swing....50&10%
Coue's Globe Hand Bells....33⅓@35%

Miscellaneous—
Farm Bells....*lb.*, 2¼@2½¢
Church and School....60@60&10%

Belting—Leather—
First Quality, Ex. Hy., Strictly Short Lap....60&10%
Standard....70&10@70&10&5%
Light Double....75&10%
Cut Leather Lacing....45@50%
Leather Lacing Sides, per sq. ft.25¢

Rubber—
Competition (Low Grade), 70&10@75%
Standard....60&10@70%
Best Grades....40@50%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1908 list:
Chain, Parts, Spokes....50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—
Common Wooden....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined....55%
Embossed....55%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co....33⅓&10%

Bolts
Carriage, Machine, &c.—
Common Carriage (cut thread):
⅜ x 6 and smaller....75&10%
Larger and longer....70&10%
Common Carriage (rolled thread):
⅜ x 6, smaller and shorter, 75&10&5%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends, with C. & T. Nuts, 70&10%
Machine (Cut Thread):
⅜ x 4 and smaller....75&10&5%
Larger and longer....70&10&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch	3	4	5	6	8
Per doz..	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:
Inch	6	8	10
Per doz..	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:
Inch	6	8	10
Per doz..	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch	6	8	10
Per doz..	$0.75	.95	1.25

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed....60&10%
Spring....70&10@70&10&10%
Shutter....50&5@50&10&5%
Square Neck....75@75&10%
Square....70&10@70&10%
Ives' Mortise....10%
Ives' Wrought Metal....10%

Expansion—
F. H. Evans' Crescent....40@40%
Richards Mfg. Co....55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type..60&10&5&2½%
Star, Wood Screw Type....40%
Star, Machine, Single Wedge....60%
Star, Machine, Double Wedge....60%
Steward & Romain Mfg. Co.:
Style No. 13, Double....60%
Style No. 1, Single....60%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw....66⅔%

Plow and Stove—
Plow....65&5@70%
Stove....85@85&5%

Tire—
Common Iron....80%
Norway Iron....80%
American Screw Co.:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84..62½%
Bay State, list Dec. 28, '99....50%
Franklin Moore Co.:
Norway Phila., list Oct, 16, '84...80%
Eagle Phila., list Oct. 16, '84...62½%
Eclipse, list Dec. 28, '99....60%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec, 28, '99....50%
Norway Phila., list Oct. '84....60%
Eagle 62½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....60%
Phila., Eagle, list Oct. 16, 1884..62½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—
Borers Bung, Ring, with Handle:
Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch.....	2¼	2½		
Per doz.....	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—
C. E. Jennings & Co....25%
Langdon, New Langdon and Langdou Improved. 20&10%; Langdon Acme ....15&10%
Perfection 40%
Seavey 45%

Braces—
Common Ball, American..$1.50@$1.75
Barber's ....50&10&10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 61, 166, 206, 614....50%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces....2%&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—
Wrought Steel....80@80&5%
Bradley Metal Clasp...80&10@80&10&5%
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Stanley's Pressed Steel....80%
Stanley's Folding Brackets..70&10&5%
Taplin Victor Handy Egg Beater Bracket ....₩ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co....75&20%
Wire Goods Co....75%

Buckets, Galvanized—
M'fr's list, price per gross.
Quart..	10	12	14
Water, Light	$28.35	30.75	34.75
Water, Ex. Hvy.	46.85	49.35	53.25
Fire, Rd. Btm.	33.50	35.90	39.90
Well	37.35	41.35	46.35

10&7½&5&2½%

Bull Rings—See *Rings, Bull.*

Butts—Brass—
Wrought, High List, Oct. 26, '06.65%
Cast Brass, Tiebout's....40&10%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint....70&10@75%
Loose Pin....70&10@75%
Mayer's Hinges....70@70&5
Parliament Butts....70@70&5

Wrought Steel—
BRIGHT.
Light Narrow, Light Reversible....75&5%
Reversible and Broad.75&10%
Loose Joint, Narrow, Light Inside Blind, &c.....75%
Back Flaps, Table Cheat.70%
BRONZED.
Light Narrow, Loose Pin..55%
Light, Loose Pin, Ball Tip.65%
Broad....55%

Extra, 5¢—

Cages, Bird—
Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—
Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel..... 4¾¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Caps, Percussion—
Eley's E. B...... 52@55¢
G. D......per M. 34@35¢
F. L......per M. 40@42¢
G. E......per M. 58@50c
Musket .....per M. 62@63¢

Primers—
Berdan Primers, $2 per M. 20&5%
Primer Shells and Bullets.. 15&10%
All other primers per M. $1.52@1.60

Carpet Stretchers—
See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
32 C. F., $5.50..... 10&5%
38 C. F., $7.00..... 10&5%
22 cal. Rim, $1.50..... 10&5%
32 cal. Rim, $2.75..... 10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball..... $1.40
Central Fire..... 25%
Target and Sporting Rifle. 15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting..... 50%
Rim Fire, Military..... 15&5%

Casters—
Bed ..... 65&10@70%
Plate ..... 60@60&5%
Philadelphia ..... 70&10@75%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing)..... 70&10&10&5%
Steel Gem (Roller Bearing)..... 70%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list... 40&10%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Proof Coil—
American Coil, Straight Link:

3-16	¼	5-16	⅜	½	⅝
$7.45	4.80	3.85	3.25	3.10	3.00

¾-⅞-1 1⅛ to 1¼ inch.
$2.90 3.00
Lower prices in cask lots f.o.b. factory.
German Coil..... 70&5%
German Pattern Coil:
6-0 to 1..... 70&10&5%
2 and 3..... 60&10&10@70%
4, 5, and 6..... 50&10@50&10&5%

Halter—
Halter Chains..... 60&5@60&10%
German Pattern Halter Chains, list July 24, '07..... 70&5%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring. $26.00
6½—6-2, Straight, with ring. $27.00
6½—8-2, Straight, with ring. $30.00
6½—10-2, Straight, with ring. $35.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c..... 70&10@—%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron ..... 60&10&5@60&10&10%
Brass 65%
Safety and Plumbers' Chain. 75%
Gal. Pump Chain.... *lb.*, 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coll.....35&2½@40%
Triumph Dog..... 50&10@60%
Brown Halter and Coil.....@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@10%
Niagara Dog Leads and Kennel Chains ..... 45@60&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl. Jointed Chain.... 70%

Chain and Ribbon, Sash—
Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; S Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.90@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk—
Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 50@55¢
Carpenters' White...gro., 50@45¢

Checks, Door—
Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools..... 55%
Youths' Chests, with Tools..... 40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters, etc., Chests, with Tools 30%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—
Socket Framing and Firmer
Standard List.. 80&10@80&10&10%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10..... 25&7½%
Socket Framing No. 15..... 25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White & Co..... 30@30&5%

Tanged—
Tanged Firmers..... 30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181.. 25%
L. & I. J. White Co..... 25&5%

Cold— *lb.*
Cold Chisels, good quality.. 13@15¢
Cold Chisels, fair quality.. 11@12¢
Cold Chisels, ordinary.... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels..... 50&5%

Chucks—
Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck..... 40%
Beach Pat. each $8.00..... 35&5%
Blacksmiths' 25%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible..... 35%
Empire 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws..... 35%
Universal, Com. Style Jaws..... 40%
Combination, Reversible Jaws.... 35%
Combination, Com. Style Jaws... 40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks..... 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ... 25%
Positive Drive..... 40%
Planer Chucks..... 30%
Standard 45%
Drill Press Vises..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21..... 35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 53, 34 and 35.. 25%
Independent Iron, Nos. 18 and 318.. 35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15.. 40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill.. 50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—
Carriage Makers', Star, P., S. & W. Co. 50%
Besly, Parallel..... 33⅓&10%
Hammer & Co.:
Adjustable ..... 20&5%
Carriage Makers' H. P. Screw.40&5%
Myers' Hay Rack..... 50%
Lineman's Swedish Neverturn..... 65%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,
Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%

Sidewalk—
American Fork & Hoe Co.:
Star, ℔ doz., Socket, $4.00; Shank $3.50
Shank, ℔ doz., X 7½, $3.50; Shank, X 8..... $3.75

Cleavers, Butchers'—
Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—
Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Ball Bearing Horse, each.....$7.50
Stewart's New Model Sheep Shearing Machine, each.$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25%

Clips, Axle—
Regular Styles, list July 1, '05, 80&80&10%

Cloth and Netting, wire—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs..... 70%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—
Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.
Ordinary Goods..... 75@75&5%

Conductor Pipe,—
L. C. L. to Dealers:

Gal. Steel.	Charcoal.	Copper.
Northeastern:		
70&10@—%	50&10&7½%	50&10%
Eastern:		
75@—%	50&10&7½%	50&10%
Central:		
75@—%	60%	50&10%
Northwestern:		
75@—%	60%	50&10%
Western:		
70&10@—%	50&12½%	50&5%
Tennessee:		
70&10@—%	50&12½%	50&10%
Southern:		
70&10@—%	50&12½%	50&5%
Southwestern:		
70@—%	50&5%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—
L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coppers' Tools—
See *Tools, Coopers'.*

Coppers, Soldering—
Soldering Coppers, 3 lb. to pair and heavier, 21½¢; lighter than 3 lb. to pair..... 23½¢

Cord— Sash—
Braided, Drab..... *lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 22¢; No. 7, 22½¢; No. 6, 23½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18.. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India..... *lb., 11@11½¢*
Cotton Sash Cord, Tw'ted.. 18@20¢
Patent Russia..... *lb*.... 20¢
Cable Laid Russia..... *lb*... 21¢
India Hemp, Br'd'd..... *lb*... 21¢
India Hemp, Twisted.. *lb.* 13@14½¢
Patent India, Twisted..lb... 17¢
Pearl Braided, cotton, No. 6, ℔ lb. 20½¢; No. 7, 19½¢; Nos. 8 to 12, 19½¢, in 12 doz. to 100 doz. lots.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to10..... ℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord..... 50¢
Massachusetts, White... ℔ lb 40¢
Massachusetts, Drab.... ℔ lb 45¢
Phoenix, White, Nos 8 to 12.... 27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Linen... 57½¢
See also Chain and Ribbon.

Wire, Picture—
Full Length..... 90@—%
Short Length..... 30&20@—%
Hendryx Standard Wire Picture Cord. 90&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—
Grain 50%

Crayons—
White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black..... $4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks..... $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ⅛ x 3-16.. $2.50; 5 x 1¼ x 3-16..... $3.00
Suremark, Black, $2.25; Blue, Red and Yellow..... $2.50

Crooks, Shepperds'—
American Fork & Hoe Co.:
Montana ..... ℔ doz. $4.50

Crow Bars—See *Bars, Crow.*

Cultivators—
American Fork & Hoe Co.:
Victor Garden..... 50&10%

Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor..... ℔ doz. $3.00
Wm. Rogers & Son..... ℔ doz. $2.50

Cutters— Glass—
H. H. Mayhew Co..... 40%
Red Devil..... 60%
R. Mfg. Co..... 40%
Woodward 50%

Meat and Food—
American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2.50	$2.75	$1.50	$6	25@25&7½%	

No. 202, $1.50..... 40&7½%
P., S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant..... ℔ doz. 40@50%
Nos. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
New Triumph No. 605, ℔ doz. $24.00.. 40%
Russwin Food, No. 1, $24.00; No. 2, $27.00; 3, $42.00..... 45&10&10%
$15.00 $18.00
Enterprise Beef Shavers..... 25@30%

Siaw and Kraut—
Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—
All Iron, Cheap...doz, $1.25@4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—
Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.50
Split Handle Post Hole Diggers, ℔ doz., $7.50
Hercules Pattern, ℔ doz..... $9.50
Kobler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dividers—See *Compasses.*

Drawing Knives—
See *Knives, Drawing.*

Dressers Emery Wheel—
Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—
Blacksmith's Common Drilling Machines..... $1.50@1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
C. & C. Ratchet..... 25%
Reversible Ratchet Die Stocks.... 25%
Goodell Automatic Drills.50&10&10&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $1.86; 2, $8.16.
Millers Falls Automatic Drills..33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style 11 Improved ..... 40@40&5%
Ratchet, No. 912..... 40@40&5%
Ratchet, Celebrated..... 40@40&5%
Ratchet, Whitney's, P., S. & W., 40&10@50%
Whitney's Adjustable, No. 10, $12.00. 33⅓%

Twist Drills—
Bit Stock..... 70@70&10%
Taper and Straight Shank. 65@65&10%

Drivers, Screw—
Screw Driver Bits, per doz.. 45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2¼-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's Screw Drivers, Handles and Ferrules 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible ..... 55&7½%
Standard Neverturn..... 66⅔%
Star ..... 75&5%
Screw Driver Bits..... 25%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.75; 20, $8.17; 21, $9.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7363 to 7368, 60%; No. 7340, 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern	75&10&5%	50&10%
Eastern	80%	50&10%
Central	80&10&5%	50&10%
Northwestern	80&10&5%	50&10%
Western	80&5%	50&5%
Tennessee	80&5%	50&10%
Southern	75&10%	50&5%
Southwestern	75&10&2½%	50&5%

Terms.—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are quite general owing to market irregularities.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories: Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4..... 80%
Sizes 1½, 2½, 3½, 5, 6... 60&10%
No. 26..... 50%
No. 24..... 25%
Copper Elbows..... 50%

Elbows, Stove Pipe—
Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue..... 40&10&10%
Reeves, Dover, Flat Crimp..40&10&5%

Emery, Turkish—

	¼ to ⅝:	½ to 2:	Flour.
Kegs..... *lb.*	5 ¢	5½¢	5½¢
½ Kegs..... *lb.*	5¼¢	5¾¢	5¾¢
¼ Kegs..... *lb.*	5½¢	6 ¢	4 ¢

10-lb. cans, 10 in case....6½¢ 7 ¢ 6 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢
NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, emon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ₱ gro., $1.08.....10%
Titan, ₱ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....80&10@60%
Metallic Key, Leather Lined, ..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ₱ doz., $36.00.....40&10%
Lane's, ₱ doz., $36.00.....40&10%
National Measuring, ₱ doz, $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Disston's Superfine.....60%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

Peck, Stow & Wilcox Co.:

In.	15	17	19	21	24
	$4.00	4.40	4.75	5.50	6.50

....30%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
American Fork & Hoe Co.:
Iowa Dig-Ezy Potato.....70&5%
Hay, Regular, 3-tine.....45&20&12½%
Hay, Regular, 4-tine.....60&7½&5%
Champion, Hay.....60&12½%
Acme, Hay.....60&20%
Manure, Regular, 4-tine.....65&5%
Manure, Regular, 5 and 6 tine...70%
Champion, Manure.....65&5%
Columbia, Manure.....70%
Acme, 4-tine.....60&10&5%
Round Shoulder Header, 4-tine..65%
Champion, Header.....65%
Dakota, Header.....65%
Kansas Header.....65%
Wood, Barley.....35&5%
Steel, Barley.....66⅔%
Columbia, Spading.....70&7½&5%

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.40&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $1.00; 2, $1.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $1.30; 2, $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 50%

Grease, Axle—
Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand and Foot Power, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....33⅓%
Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 .....40%
Disc Grinders, each, $2.50.....40%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....70&10@—%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@10&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔@5%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Fayatte R. Plumb:
A. E. Nail.....40&2½&@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ₱ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢..80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—
Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro.$1.30@$1.40
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz....45¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle .... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₱ gro., No. 1, $8.00; No. 2, $6.50; No. 3, $5.00; No. 4, $3.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $3.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
50%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₱ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 129, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door R. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ₱ doz., 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%
Extra 5&10% often given.

Hangers— Garment—
Pullman Trouser, ₱ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net 50%

Joist and Timber—
Lane Bros. Co.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..40%

Hatchets—
Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind:
Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter..80%
North's Automatic Blind Fixtures. No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.36; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only.....	1.25	1.90	3.50
Latches only.....	.70	.75	.85

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₱ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros. Pivot, Ball Bearing 40%
Lawson Mfg. Co. Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 999.....₱ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ₱ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list February 10, 1908:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%
Extra, 5¢ —

Screw Hook and Strap.	*6 to 12 in..*	*lb. 3½¢*
	14 to 20 in..	*lb. 3½¢*
	22 to 24 in..	*lb. 3 ¢*

Screw Hook and Eye:
¾ to 1 inch.....lb. 8½¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢
10&7½&5%

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	43	48	52	56
Jap. Funnel	53	56	59	43

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 102.....each $1.00
Steel Mortar, No. 103.....each $1.35

Hoes— Eye-
Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil....47½%
Am. Fork & Hoe Co. (Scovil Pattern)....60&5%

Handled—
Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit....$2.50
American Fork & Hoe Co.:
Regular, Cotton....75&10&5&2½%
Crescent, Cultivator....75&2½%
Mattock, Senior....70%
Mattock, Junior....70%
Sprouting....50%
Tobacco, Harper's....66⅔&15&10%
Warren....55&10&10&5%
Ivanhoe....65&15&10%
Cultivator, B B 6....70&10&10&5%
Cultivator, B B 6½....70&10&10&5%
Weeding, Acme....72½&10&2½%
Scuffle, Lightning....60&5%

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₱ doz. $24.00....45&10%

Door—
Bardsley's, Iron, 40%; Brass and Bronze....25%
Empire....50%
Pullman....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip....50%
Superior....40%

File and Tool—
Nicholson File Holders and File Handles....33⅓&40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $18.00; ₱ doz....$2.00

Trace and Rein—
Fernald Double Trace Holder, ₱ doz. pairs....$1.25
Dash Rein Holder, ₱ doz....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian and Swaty, 50%; German....33⅓%

Hooks—Cast Iron—
Bird Cage, Reading....40%
Clothes Line, Reading List....40%
Coat and Hat, Reading....45&20%
Coat and Hat, Wrightsville....60&5%
Harness, Reading List....40%

Wire—
Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10@80%; Ceiling..75&10@80%
Columbian Hdw. Co., Gem....75&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.: Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Wrought Iron—
Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton....doz. $1.25@$1.50
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—
Hooks, Bench, see Steps, Bench.
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz....$1.25@$1.50
Whiffletree....lb. 5¼@6¢
Hooks and Eyes:
Brass....60@60&10%
Malleable Iron....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks....40%
Turner & Stanton Co. Cup and Shoulder....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade....ft. 8@ 9¢
Fair Quality....ft. 10@11¢

Irons— Sad-
From 4 to 10....lb. 2½@2¾¢
B. B. Sad Irons....lb. 3¼@3½¢
Mrs. Potts', cents per set:

Nos.	5	55	60	65
Jap'd Caps	85	93	96	98
Tin'd Caps	91	88	1.01	98

New England Pressing..lb. 3¾@4¢

Bar and Corner—
Richards Mfg. Co., Bar, 60&10%; Corner....60%

Pinking—
Pinking Irons....doz. 60@65¢

Irons, Soldering
See *Coppers.*

Jacks, Wagons—
Covert Mfg. Co.:
Auto Screw....30&2%; Steel, 45%
Lockport....50%
Lane's Steel....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s....25%

Ladder—
Richards Mfg. Co., Ladder Jacks, 50%

Jointers—
Pike Mfg. Co., Saw Jointers, $7.00...40%

Kettles—
Brass, Spun, Plain....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c....30%
Wilkinson Shear & Cutlery Co....60%

Corn—
Columbian Cutlery Co., Wilcut Brand Knives and Hooks....60%
American Fork & Hoe Co.:
Easy Cut, ₱ doz. No. 10 C H...$2.10
Easy Cut, ₱ doz., No. 10 B C H..$2.20
Acme, ₱ doz....$2.35
Dent, ₱ doz....$2.35
Adjustable, Serrated, ₱ doz....$1.90
Serrated, ₱ doz....$1.85
Yankee, No. 1 C H....$1.35
Yankee, No. 2 C H....$1.15

Drawing—
Standard List....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's....66⅔@70%
Watrous....16⅔%
L. & I. J. White....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge....₱ doz. $9.50
Iwan's Serrated....₱ doz. $10.00

Miscellaneous—
Farriers' ....doz. $2.60@3.55
Wostenholm's ....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch or Maple, Rubber Tip....gro. $1.25@1.40
Carriage, Jap., Drive, all sizes, gro. 35@40¢
Door, Mineral....doz. 65@70¢
Door, Por. Jap'd....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—
See *Belting, Leather*

Ladders, Store, &c.—
Lane's Store....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112....50%
Climax Shelf, No. 113....50%
Trolley, No. 109....50%

Ladles, Melting—
L. & G. Mfg. Co., Melting and Plumbers'....25%
P., S. & W....40&10%
Reading....60%

Lamps,—
Hammer's M. I. Hand....45%

Lanterns—Tubular—
Regular, No. 0....doz. $3.50@4.00
Side Lift, No. 0....doz. $4.00@4.50
Hinge Globe, No. 0. doz. $4.00@4.50
Other Styles....40@40&10%

Bull's Eye Police—
3-inch....$3.75@4.00

Latches— Thumb—
Roggin's Latches, Jap'd, with Screws....doz. 35@40¢

Door—
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125....50&5%
Richards' Trump, No. 127....$1.50

Leaders, Cattle—
Small....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—
See *Pumps—*

Lifters, Transom—
R. & E....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.30*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25....30%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines....40%
Clothes Lines, White Cotton....30%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—
Cabinet Locks....33⅓@33⅓@75%

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co....40%
R. & E. Mfg. Co....10%

Padlocks—
R. & E. Mfg. Co. Wrought Steel and Brass....75&10%

Sash, &c.—
Ives' Patent:
Crescent....10%
Automatic Gravity Metal Sash, ₱ gro., $149.58....10%
Window Ventilating....10%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks....40%
Taylor Mfg. Co., Perfect Ventilating, ₱ doz....$0.75@$1.00

Machines—Boring—
Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co....$22.00
Jennings', Nos. 1 and 4....25&7½%
Millers' Falls....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved....40&10%

Corking—
Reisinger Invincible Hand Power... ₱ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Lock Brake....20%
Moore's Cyclone High Speed Chain Hoist....25%

Ice Cutting—
Chandler's....12½%

Washing
Boss Washing Machine Co.: Per doz.
Boss No. 1....$57.00
Boss Rotary....$57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1....$50.00
Standard Perfection....$27.00
Cincinnati Square Western....$33.00
Uneeda American, Round....$33.60

Mallets—
Hickory....45&5@50%
Lignumvitæ....45&5@50%
Tinners' Hickory and Applewood....doz. 45&5@50%

Mangers, Stable—
Swett Iron Works....50%

Mats, Door—
Acme Flexible Steel....50%
Elastic Steel (W. G. Co.), new list..50%
Everlasting Flexible Steel....33⅓%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.:
Coffee....20@25%
Shell and Corn....25&10%
National list Jan. 1, 1902....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side....50&10%
Swift, Lane Bros. Co....30%

Motors, Water—
Divine's Red Devil....30%

$2.50	3.50	10.00	15.00	....33⅓%
No. 1.	2	3	4	

Lippincott's:

No.	1	2	3	4	
	$2.50	3.50	10.00	15.00	..33⅓%

Pike Mfg. Co., Tool and Knife Grinding....33⅓%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental....60%
Great American....70%
Great American Ball B'r'g, new list..70%
Quaker City....70%
Pennsylvania....60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf....50%
Pennsylvania Horse....33⅓&5%
Pennsylvania Pony....40&5%

Nails—
Wire Nails and Brads, Miscellaneous....85&5@85&10%
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	.. ₱ lb. net, 12¢
Coleman	13	12	12	11	11	net ₱ lb
New Haven	23	21	20	19	18	.. ₱ lb. net, 12¢
Livingston	19	18	17	16	16	....10%
Western						₱ lb 8½¢

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	2	2½	3 in.
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters—
Brass....30%
Plated....30&10%

Nippers—
See *Pliers and Nippers.*

Nipples—
Standard Nipple Co.:
Wrought Pipe Nipples....80%

Nuts— *Blank or Tapped.*

Cold Punched:	*Off list.*
Square	*5.40¢*
Hexagon	*6.00¢*
Square, C., T. & R.	*5.80¢*
Hexagon, C., T. & R.	*6.60¢*
Hot Pressed:	Off list.
Square	*5.90¢*
Hexagon	*6.40¢*

Oakum—
Best....lb. 6½¢
U. S. Navy....lb. 6 ¢
Navy....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—
Pike Mfg. Co., Stonoil....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—
Steel, Copper Plated....75&10%
Chase or Paragon:
Brass and Copper....50&10%
Zinc....65&10@70%
Railroad....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans....70@75&10%
Railroad Oilers, &c....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans....70@75&10%
Railroad Oilers, etc....60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans....70@70&10%
Railroad Oilers, &c....60@68&10%

Openers—Packing Box—
Herculever, ₱ doz., $24....30%

Can Openers—

	Per doz.
Sprague, Iron Handle	*30@35¢*
Sprague, Wood Handle	*40¢*
Sardine Scissors	*$1.75@3.00*

Can and Bottle Openers, ₱ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty....$0.75

Egg—
Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope, any quantity....16@17¢

Rubber—
(Fair quality goods.)

Sheet, C. I.	*11@12¢*
Sheet, C. O. S.	*11@12¢*
Sheet, C. B. S.	*12@13¢*
Sheet, Pure Gum	*40@45¢*
Sheet, Red	*40@50¢*

Jenkins' '96, ₱ lb, 80¢....25%

Miscellaneous—
American Packing....lb. 7@10 ¢
Cotton Packing....lb. 16@25 ¢
Italian Packing....lb. 9@10¢
Jute....lb. 4@4¼¢
Russia Packing....lb. 9@10¢

Pails, Water, Well, &c.—
See *Buckets.*

Paint—
Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size....20%

Pans— Dripping—
Standard List....75&5@75&10%
Edwards, Royal Blue....75%

Fry—
Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.85*	*0.95*	*1.15*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos:	*lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	*2½¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb. per 100 sq. ft.	*3½¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.	*3½¢*

Per roll.

Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll. 56@70¢
Heavy weight, 40 lbs. to roll. 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton....$54.50
Red Rope Roofing, 250 sq. ft. per roll....$1.75

Tarred Paper—
1 ply (roll 400 sq. ft.), ton. $34.00@$38.00
2 ply, roll 108 sq. ft....65¢
3 ply, roll 108 sq. ft....88¢
Slater's Felt (roll 500 sq. ft.) 80¢

Sand Paper and Cloth—
Flint and Emery....50&10%
Garnet Paper and Cloth....25%

Parers—Apple—

Goodell Co.:	
Family Bay State	₱ doz. $15.00
Improved Bay State	₱ doz. $36.00
New Lightning	₱ doz. $7.00
Turn Table '98	₱ doz. $6.00
White Mountain	₱ doz. $5.00
Bonanza Improved	each $7.50
Dandy	each $10.00
Eureka Improved	each $20.00
New Century	each $20.00
Ranger	each $30.00

Livingston Nail Co.:
Dainy ..... ℔ doz. $4.00
Little Star ..... ℔ doz. $5.00
Rocking Table ..... ℔ doz. $6.20
Reading Hardware Co.:
Advance ..... ℔ doz. $4.00
Baldwin ..... ℔ doz. $4.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25

Orange—
Goodell Co., Success ..... each $20.00

Potato—
Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—
(List Jan., 1908.)
List ..... 75&10%
Cronk's Handled Garden Mattock, ℔ doz., $3.00 ..... 33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '05 .. 60@60&10%

Pipe, Cast Iron Soil—
Eastern Prices:
Standard, 2-6 in. ..... 68% } Extra, 10 & 10&5%
Extra Heavy, 2-6 in. ..... 74% }
Fittings, Standard and Heavy 80¾%

Pipe Merchant—
Carloads to Consumers:

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in..	} See Trade Report			
⅜ in.				
½ in.				
¾ to 6 in.				
7 to 12 in.				

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$5.90	$6.90
6 in., Uniform Color	6.40	7.40
7 in., Uniform Color	7.40	8.40

Planes and Plane Irons—
Wood Planes—
Bench, first qual ..... 30@30&5%
Bench, second qual ..... 40@40&5%
Molding ..... 25@25&5%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes
Chaplin's Iron Planes 60%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ℔ doz. $7.50

Plates—
Felloe ..... lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—
Never-Break ..... 75&10%

Pliers and Nippers
Button Pliers .... 75&5@75&10&5%
Gas Burners, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45, $1.50.

Gas pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 60%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers 70%
Wire and Cutting Pliers 75%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 10%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor. 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston & Sons:
Shafting Levels ..... 60&10%
Pocket Levels ..... 60&10%
Plumbs and Levels ..... 60&10%
Track Level and Gauge ..... 60&10%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers .... lb. 9 ¢
½-lb. papers ..... lb. 9½¢
¼-lb. papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists .. 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Ladd Co.:
Putzade Liquid, ℔ gro., ½ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ℔ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00.. 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans., ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $1.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2, gal pails, ℔ doz., $24.00; each, $2.50; 1 lb cans, each ..... 75¢
Glasbright Powder, bbls., ℔ lb..20¢

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.20; gro.$12.00
2 qt. Square..doz.$1.50; gro.$15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 6 ft., 46¢; 6½ ft., 48¢; 7 ft., 50¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned ..... 50&10%

Powder—
Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
} Discount to the trade, 10%.

NOTE.—Prices vary according to territory.
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.99
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)..	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—
Fruit, Wine and Jelly—
Enterprise Mfg. Co. ..... 20@25%
Seal Presses—
Morrill's No. 1, ℔ doz., $20.00 ..... 50%
Pruning Hooks and Shears
See *Shears.*

Pullers, Nail, Etc.—
Cyclops 50%
Elmore Tool Mfg. Co.:
Drop Forged Tack Pullers 10%
Nail Pullers 40%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co. Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Taylor Mfg. Co., Sampson Tack. ℔ doz. $0.40

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye, doz., ½ in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz...	$0.65	.85	1.20
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.22	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in ..... 17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.. .20@21¢
Acme, No. 35..1¾ in.. 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel, Eagle, ℔ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in., 27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ℔ doz. ..... 19¢
Common Sense ..... ℔ doz. 20¢
Merit, ℔ doz., 2¼ in. ..... 37¢
Fox-All-Steel, Nos. 3 and 7, 2 in.. ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in. ..... 20½¢
No. 28 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout ..... 75&10&5@80
Wood Pumps, Tubing, &c 50%
Barnes Dbl. Acting (low list) 50%
Bar Pitcher Spout 80%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) ..... 50&5%
Flint & Walling's Fast Mail (low list) ..... 50&5%
Flint & Walling's Tight Top Pitcher 80%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) } 50%
Myers' Power Pumps ..... }
Myers' Spray Pumps ..... }

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leathers—Per 100:

Inch....	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

} 30&30&5%

Punches—
Saddlers' or Drive, good, doz. ..... 50@75¢
Spring, single tube, good quality $1.75
Revolving (5 tubes) .... doz. $3.50
Bemis & Call Co.'s Cast St'l Drive. 50%
Elmore Tool Mfg. Co.:
Machinists' Center 40%
Tinners': Solid, 50%; Prick 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Tinners' Hollow, P., S. & W. Co.. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 40&10%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail ..... 2¾¢
Griffin's:
XXX, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft. $3.45
O. N. T., ℔ 100 ft., 1 in. $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
Trolley, No. 301, ℔ ft. ..... 9¢
McKinney's:
Hinged Hanger Track, ℔ ft., 11¢ ..... 60&5%
1 x 3-16 Track ..... 55&7½%
Myers' Stayon Track ..... 60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
American Fork & Hoe Co.:
Lawn, ℔ doz., No. 24, $2.50; No. 20 ..... $2.25
Cronk's:
Steel Garden: Champion, ℔ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ℔ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Jumbo Lawn, 36-tooth..℔ doz. $5.00
Lawn Queen, 20-tooth..℔ doz. $2.85
Lawn Queen, 24-tooth..℔ doz. $3.00
Paragon, 20-tooth ..... ℔ doz. $2.65
Paragon, 24-tooth ..... ℔ doz. $2.75
Steel Garden, 14-tooth..℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros. ..... 70&5@70&10&5%
Liveright Bros.' Gold Medal. 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
John Engstrom Swedish 65%
Sharp Shaver 60%
Fox Razors, ℔ doz., No. 42, $24.00; No. 44, $20.00; No. 82, Platina, $36.00. } Dis. 60%

Reels, Fishing—
Henshaw:
M 6, Q 6, A 6, B 6, M 9½, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 92084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN. 33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action ..... 95¢@$1.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber... $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.10*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—
Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz..85@95¢
Blair's Rings..per gro.$5.50@$6.00
Blair's Ringers..per doz..65@70¢

Rivets—
Copper Rivets and Burrs....50%
Tinners' and Miscellaneous Rivets ..... 80@80&10%

Bifurcated and Tubular—
Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@63¢.
Tubular, per doz. boxes, 50 count, 60@68¢; 100 count, $1.12@$1.26.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.56¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger:
Highest Grade.....lb.8½@8¾¢
"Pure" .....lb.8¼@8½¢
Sisal, 7-16 in. diam. and larger:
Pure .....lb.7@7¼¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Pure .....lb.7¼@7½¢
Sisal, Tarred, Medium Lath Yarn:
Pure .....lb.6¼@6½¢
Cotton Rope:
Best, ¼-in. and larger..16½@18¢
Medium, ¼-in. and larger.15@16¢
Common, ¼-in. and larger..7½¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. and up. lb. .....6@6½¢
Thread, No. 2, ¼-in. and up. lb. .....5½@6¢

Wire Rope—
Galvanized ..... 47½&2½%
Plain ..... 55&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60&5%
Ivory ..... 25&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25&25&10%
Miscellaneous ..... 50&50&10%
Stephens' Combination 55%
Stationers' ..... 50&50&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Unson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*
Sash Locks—See *Locks, Sash.*
Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¾ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 40%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Hand Ice Saws 45%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Chromol Blades 35%
Hack Saw Frames 30%
Simonds, 25%; The Best, 35%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades, Hand Frames, Power Blades 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain ..... $2.10@2.20
Union Platform, Stpd ..... $2.30@2.80
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wag- 50%

Scrapers—

Box, 1 Handle ..... doz. $1.85@2.10
Box, 2 Handle ..... doz. $2.35@2.50
Ship ... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80&5%
Coach, Gimlet Point ..... 80&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), not advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—
List July 23, 1903.

Flat Head, Iron ..... 87½&5@ .. %
Round Head, Iron ..... 85&5@ .. %
Flat Head, Brass ..... 80&5@ .. %
Round Head, Brass ..... 77½&5@ .. %
Flat Head, Bronze ..... 75&5@ .. %
Round Head, Bronze ..... 72½&5@ .. %
Drive Screws ..... 87½&5@ .. %

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Plain Grass, Cutting Edge Polished ..... $6.25@$6.50
Clipper, Bronzed Web ..... $6.50@$6.75
Solid Steel, Web and Backs Polished ..... $7.00@$7.25
Bush, Weed and Bramble, Painted ..... $6.50@$6.75
Grain, Painted, Cutting Edge Polished ..... $8.25@$8.50
Clipper Grain, Bronze Web, $8.50@$8.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Garden Tool Sets—

American Fork & Hoe Co.:
Rake, Shovel and Hoe, ℔ doz. sets, No. 3 P F $7.25

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Elmore Tool Mfg. Co. 30%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt. ..... ℔ gro. $7.50

Rivet—

Regular Hat ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut ..... ℔ doz. $7.50
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Royal, Hand ..... ℔ doz. $4.50
Seymour Smith & Son's 65%
Taintor Positive ..... ℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50
} 50%

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Seymour Smith & Son's 50%

Shears—

	7	8	9 in.
Cast Iron			
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel ..... 60&10&5%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel ..... 50&10&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles ..... 70&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%
Acme Cast Snips ..... 40@45&5%
W. H. Compton Shear Co., Forged Steel Handles 35%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel 50%
Niagara Snips 40%
P., S. & W. Forged Handles, 25%; W, R, W 50%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%
W. H. Compton Shear Co., Dropped Forged Steel 35%
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ℔ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P., S. & W. Co. ..... 10&10%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners ..... 75&10%
Wood Handle Pruning Shears 40%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 15%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Union, League, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in	$4.05	$5.05
Dixie, 10 x 14 in	4.25	5.45
Dixie, 7 x 10 in	5.25	6.70

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ℔ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.70
Drop, B and larger 1.95
Buck 1.95
Chilled 1.95
Dust 2.30

Shovels and Spades—

Association List ..... 40&7½%@40&10%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $2.50@$2.75
Wood and Mall, D Handle, $2.65@$2.90

Sieves and Sifters—

Hunter's Imitation, gro $9.50
Hunter's Genuine, per gro $12.00

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ℔ doz. $39.00

Sieves, Seamless Metallic

Mesh	14	16	18	20
	Per dozen.			
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 24 to 24 x 50 in 50%
24 x 60 to 24 x 120 in 30%
Barnes' low list 40%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@70&10%
Steel ..... 35@40%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60&7 tens.
Victor A, Noiseless .. 60&4 tens 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Grass Scythe ..... 50@50&5%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50¢55¢
Tables ..... per gro. $0.90@$1.00
Atlas Mfg. Co.:
Tea Spoons, ℔ gro. ..... 50¢@55¢
Table Spoons, ℔ gro. ..... $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 39 in. ..... ℔ doz. $1.00

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 .... per pair. 45@47¢
1½ x 3 x 28 .... per pair. 68@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ℔ doz. $12.00
Enterprise ..... 25@30%
Hero Fruit Jar Co., ℔ doz. $4.50
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. } *List Jan. 5, 1900.*
Steel and Iron .. } *80@—%*
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, 60&10%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75
Victor, ℔ gro. $9.00

Staples—

Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $2.05; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros.' 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies 40%

Stones, Oil, &c.—

Pike Mfg. Co., 1907 list: ℔ lb.
Arkansas St., No. 1, 3 to 5½ in. $2.80
Arkansas St., No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 90¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) ... 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks 40%
Hindostan No. 1, R'g'lar, ℔ lb. 8¢
Hindostan No. 1, Small, ℔ lb. 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ℔ lb. 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢
} 33⅓%
} 25%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S., ₱ gro. $12.00
Lamoille S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $9.50
Green Mountain S. S., ₱ gro. $7.00
Extra Indian Pond S. S., ₱ gro. $8.00
No. 1 Indian Pond S. S., ₱ gro. $7.50
No. 2 Indian Pond S. S., ₱ gro. $5.00
Leader Red End S. S., ₱ gro. $5.00
Quick Cut Emery, ₱ gro. $10.00
Pure Corundum, ₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8.80
Emery Scythe Rifles, 3 Coat, $11.00
Emery Scythe Rifles, 4 Coat, $13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ₱ gro., $12.00 33⅓%
$12.00 33⅓%
Lightning (Artificial), ₱ gro. $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers, ₱ gro. $9.00

Stops—Bench—

Millers Falls 15&10%
Morrill's, ₱ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%
Seymour Smith & Son's 60%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stevens Co. 20%

Straps—Box—

Acme Embossed, case lots 20&10&10%
Cary's Universal, case lots 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 55¢
All Steel Socket, doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ₱ doz., $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses 25@25&7½%
National Specialty Co., list Jan. 1, 1902 50&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Goshen Sweeper Co.:	Per doz.
Gilt Edge	$27.00
Superfine	26.00
Majestic	24.00
Select, Nickeled	22.00

National Sweeper Co.:
National Queen, Nickeled $27.00
Martha Washington, Nickeled 25.00
Monarch, Japanned 20.00
Perpetual, Japanned 18.00

Streator Metal Stamping Co.:
Model E, Sanitaire $25.00
Eureka 15.00
Streator Majestic, Nickeled 24.00
Streator Conqueror, Japanned 22.00

NOTE.—Leading Manufacturers give the following rebates from list prices: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks 90&25@—%
American Cut Tacks 90&25@—%
Swedes' Cut Tacks 90&30@—%
Swedes' Upholsterers' 90&35@—%
Gimp Tacks 90&35@—%
Lace Tacks 90&35@—%
Trimmers' Tacks 90&30@—%
Looking Glass Tacks 65@—%
Bill Posters' and Railroad Tacks 90&10@—%
Hungarian Nails 80@—%
Finishing Nails 70@—%
Trunk and Clout Nails 75&5@—%
NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90¢ tens@—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
50	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin 50@—%
Patent Leather 25@30&5%
Steel 33⅓&5%
Chesterman's 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkins':
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ¾-inch and larger per 100 lb $2.55@2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. 30@35%

Ties, Bale—Steel Wire—

Single Loop 85¼&10%
Monitor, Cross Head, &c. 70&5%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White 20@20&5%

Haying—

Myers' Hay Tools 50%

Ice Tools—

Gifford-Wood Co. 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools 35&5%
Simond's Improved 33⅓%
Simonds' Crescent 30%

Ship—

L. & I. J. White 25%

Torches—

Hammers, Eugine, ₱ doz. $4.50

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 75@10%
Newhouse 50&5%
Hawley & Norton 65&10%
Victor 75@75&10%
Oneida Community Jump 70&5%
Stop Thief 60%
Tree Trap 60%
Hector 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps (Genuine), ₱ doz.:

	Crate lots.	Small lots.
No. 1, Rat	$11.50	$14.50
No. 3, Rat	$5.75	$6.50
No. 3½, Rat	$4.70	$5.25
No. 5, Mouse	$2.25	$3.00

Animal Trap Co.:
Out o' Sight, Mouse, ₱ doz. $0.60
Out o' Sight, Rat, ₱ doz. 1.20
Easy Set, Mouse, ₱ doz. .35
Easy Set, Rat, ₱ doz. .85
Out o' Sight Chockers, ₱ doz. holes .12
Out o' Sight, Tin, 5-hole, ₱ doz. traps .75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in bulk, net ₱ gro. $5.50
In 1 doz. boxes ₱ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks, ₱ doz. $16.00
Grocery, ₱ doz $15.00
McKinney Trucks, each, net $10.00
Model Stove Trucks, ₱ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized $67 $79 $91 $103 10&7½&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls .21@23¢
No. 12, ¼ and ½-lb. Balls .19@21¢
No. 18, ¼ and ½-lb. Balls .16@18¢
No. 24, ¼ and ½ -lb. Balls .15½@17½¢
No. 36, ¼ and ½-lb. Balls .15@17¢
Chalk Line, Cotton ¼-lb. Balls 24@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. 8½@19¢
Cotton Wrapping, 5 Balls to lb., according to quality. 13½@19¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 15½@16¢
American 3-Ply Hemp, 1-lb Balls 13½@16¢
India, 2-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine) 7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7½@9¢
India 2-Ply Hemp, 1½-lb. Balls, 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls 9@11¢
Mason Line, Linen, ½-lb. Bls. 17¢
No. 264 Mattress, ¼ and ½ lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply, B 6¢; *A* 7½¢

Vises—

Solid Box 60@60&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co., 40&5%; Slide 65%
Fisher & Norris Double Screw, each, Nos. 2, $16.00; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00 15&10%
Fisher-Brooks Bench Vises, No. 0, $3.90; No. 1, $5.90; No. 2, $8.25; No. 3, $10.50; No. 4, $13.80 15&10%
Fulton Mach. & Vise Co.:
F. & R. Double Swivel Machinists' 40%
Star, Solid Jaw, Machinists' 40%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Parallel Bar 15%
Perfect, 15%; Lightning Grip 15%
Merrill's 25%
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Rock Island 25%
Snediker & N. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, ₱ doz. $1.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
F. & R. Double Swivel Coachman's 40%
Star Solid Jaw Woodworkers' 60%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Fulton Machine & Vise Co., Combination Pipe 70%
Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
57 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up .60¢
B. E., 9 and 10 .70¢
B. E., 8 .80¢
B. E., 7 .80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 45&10%
Ground 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs $2.75@$3.00
White Enameled Ware:
Maslin Kettles 65&10%
Covered Wares:
Tinned and Turned 35&10%
Enameled 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
El-an-ge 50&10%
Iron Clad Ware 70&10%
Lava and Volcanic, Enameled 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles 65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd 60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

No.	₱ doz.
800—Brass King, Single Surface, Open Back	$2.80
862—White Hen, Spiral Grimp Glass	$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.35
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back	$2.80
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
707—Jewel, Single Zinc, Pail Size	$1.25

St. Louis Washboard Co.
Ben Hur, Brass, Open Back $2.50
Brass Key, Open Back $2.75

Washers—Leather, Axle—

Solid 90@90&10%
Patent 90@90&5%
Coil: ¾ 1 1¼ 1½ inch.
9¢ 10¢ 11¢ 15¢ per box.

Iron or Steel—

Size bolt 5-16 ⅜ ½ ⅝ ¾
Washers $1.90 1.90 2.70 2.50 2.30
The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ₱ 100 lb. discl.; in 100 lb kegs add 10¢ net ₱ 100 lb; in 5 or 10 lb boxes, add 50¢ net ₱ 100 lb; in 1 lb boxes, add $1.00 net ₱ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish .lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co. 30&2%

Sash—

Per net ton $22.50@—

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.90; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 .72&10&7½%
10 to 18 .72½&10&10%
19 to 26 .75&10&10&2½%
27 to 36 .77½&7½%
Galvanized:
6 to 9 .72½&10%
10 to 14 .72½&10&5%
15 to 16 .72½&10&5%
17 to 18 .72½%
19 to 26 .70&5&2½%
27 to 36 .65&10&10%
Coppered:
6 to 9 .65&10&10%
10 to 14 .70&10&5%
15 to 18 .65&10&10&10%
19 to 26 .70&5&2½%
27 to 36 .72½&10&2½%
Tinned:
6 to 18 .67&10&10%
Brass .15¾¢ *lb., base*
Copper .15¼¢ *lb., base*
Cast Steel Wire .50%

Spooled Wire—

Annealed and Tinned .75@75&10%
Brass and Copper .70@70&10%
Retailers' Assortments, per box, $1.90@$2.10
Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods .90&10%
Brass Wire Goods .90&10%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50.
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—*See Trade Report*

Wrenches—

Agricultural .80&10@80&10&5%
Alligator or Crocodile .70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S .45@45&5%
Cline 60&10%
Alligator Pattern, 70%; Bull Dog, 70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut 50&5%
Combination Black 50&5%
Merrick Patter 50&5%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model 40&10&5&5%
Coes' Genuine Hammer Handle 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 70%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots 50&10%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W. 50&10%; full cases 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain 50%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle 40&10&5%
Other Wrenches 50%
Vulcan and Agrippa Chain 50%
Whitaker Machinists' 50&10%
Wizard Adjustable Ratchet 50%

Fruit Jar—

Benj. P. Forbes, Triumph, ₱ gro., $7.50; per doz. $0.99

Wrought Goods—

Staple Hooks, &c., list March 17, '02 .50@—%

Zinc—*(Cask lots at mill.)*

Sheet .per 100 lb., $6.75

For the Table of "Current Metal Prices" see the First Issue of Every Month.